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Aug 10, 2020

DIVISION OF OIL GAS & MINING

LISBON VALLEY MINING CO

NOTICE OF INTENT TO COMMENCE LARGE MINING OPERATIONS & MODIFICATION OF PLAN OF OPERATIONS

LISBON VALLEY COPPER MINE

M/037/0088

UTU-72499

Lisbon Valley Mining Company, LLC

920 South County Road 313

La Sal, UT 84530

Prepared For:

Bureau of Land Management (BLM)

82 Dogwood Ave

Moab, UT 84532

Utah Division of Oil Gas and Mining (DOGM)

PO Box 145801

1594 W North Temple #1210

Salt Lake City, UT 84116

Prepared By:

Lisbon Valley Mining Company, LLC

920 South County Road 313

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[P] 435-686-9950

July 2020

Introduction

The purpose of this submittal is to provide the Utah Division of Oil, Gas and Mining (UDOGM) and the Federal Bureau of Land Management (BLM) with the data necessary to re-start mining operations at the Lisbon Valley Copper Mine. This Notice of Intent (NOI) and associated Maps, Figures, and Appendices has not changed in verbiage or content to the February 25, 2020 NOI submittal by Lisbon Valley Mining Company to UDOGM other than changes summarized in the Introduction Table 1. Changes made in and subsequently to the February 25, 2020 NOI submittal of Maps, Figures, and Appendices are summarized in the Introduction table below. Changes that have been made in and subsequently to the February 25, 2020 NOI text submittal are seen in the text in red. Minor changes such as formatting, name change, and grammar are not highlighted or called out.

The purpose for submitting this document in this manner is:

1. To maintain consistency with what has already been submitted;
2. To allow for ease of review by the UDOGM and BLM staff;
3. To provide necessary updates in a clear and concise manner.

Provided in this Introduction is a table that outlines all of the comments provided by UDOGM on December 31, 2019, and how those comments have been addressed in this text, Maps, Figures, and Appendices. This table further provides UDOGM with the location in the text, Maps, Figures, Appendices of the changes made in response to the comments.

A second table is provided that lays out the key details of the mine plan and which can be used for efficient review and comparison for consistency of data between the text, Maps, Figures, and Appendices.

It is our goal to work with UDOGM and the BLM for a clean and expeditious review of this NOI and associated appendices.

Best Regards,

Introduction Table 1 – Comments

UDOGM Comment	Company Response	Response L
Map 4, Hydrology – A new Map 4 has not yet been provided. As indicated in previous reviews, the existing Dump C channels are not acceptable in their current form. Watershed boundaries and associated acres are not included in previous maps. GTO areas planned for disturbance that may affect the grade and stormwater flow should be included within disturbance boundaries on this and other maps.	Map 4 has been updated to include the hydrologic features per the aerial flights and drainage processing performed by LVMC in February 2020. Modified drainage patterns have been mapped out for installation of riprapped drainage channels and associated catchment basins.	Appendix C
Map 5, Reclamation Treatments (all maps) – Consistent with the discussion in section 110 (reclamation plan), include the following: 1) Identify berms around pit highwalls (not just at access points), as requested above. Fencing alone is not considered adequate for long-term public safety. 2) Indicate whether pond HDPE liner will be removed or modified (including to receive any graded heap leach pad slopes) 3) Identify the depths of soil replacement, as well as compacted clay and inert waste rock thickness on the heap. 4) Identify soil replacement on haul roads. Ripping alone is not likely to be successful since the roads probably contain contaminants that would inhibit vegetation. 5) The Division recommends a single ripping of spread soil on the contours, since dozer track marks from grading are less likely to resist erosion over slope lengths such as these. 6) Indicate that the landfill will be reclaimed consistent with Department of Environmental Quality (DEQ) requirements.	1) Berms have been identified around all pit perimeters. These are seen on the modified Map 5, Appendix C. 2) Pond liner already ties into the leach pad liner via the east drainage ditch. No liner modifications are required for the ponds to receive graded leach pad slopes. Regarding the areas on the north where the slopes are not yet 2.5H:1V, these slopes are to be re-graded in 2021 in preparation for another lift. Although current leach pad slopes do show some areas that are not operationally 2.5H:1V, all slopes on the leach pad are capable of being re-graded to an overall 2.5H:1V slope when taking into account the pipe ditch at the toe of the pad slopes. 3) Please see Map 5 for reclamation media layers. 4) Please see Map 5 for reclamation media layers. Placement of topsoil on haul roads will only be performed if excess topsoil is available and if the roads do not serve a post-mine land use. Further, as the roads at the mine have not been treated with surfactants, very low risk of 'contaminants' exist on the roads, as all vehicle maintenance is performed at the designated Truck Shop. 5) This is noted. Please see notes on Map 5 for reclamation practices. 6) This language is located in Section 110 as well as on Map 5.	Appendix C Section 110 Appendix I
Map 5h, Facilities Map, Truck Shop – Clarify where the Acid Storage is, identify the feature identified as Acid Storage, and change the direct reference to the explosives silo to be less specific about its contents.	The 'Acid Storage' was a mis-label. This has been corrected. Please see the updated Map 2.	Appendix C
Based on the Division's analyses of as-built conditions (elevations collected with a drone), some slopes exist that are steeper than 2.5H:1V, and additional grading of slopes will be required. Update the text as needed. As-built pre-reclamation slope angles affect the reclamation cost estimate and surety amount.	The text has been updated to call out that there still exists operational slopes that may be steeper than 2.5H:1V. The grading plan has been performed using the drone imagery from March 2020.	Throughout Appendix N Appendix I
Based on past experience at the site and landscape design principles, discuss the suitability of the reclamation slope angles on the heap leach piles and waste rock dumps to minimize erosion. Consider whether the slope lengths, particle sizes, and other factors may justify alternative measures.	This is noted. Waste Dump A & B: the overall slope lengths will be broken up by catchment benches to prevent terminal velocity of rainwater runoff to occur. For Waste Dump C, the up-gradient riprapped channels will capture most of the intercepting waters. The water the does fall will continue to follow the set course, with the modification of the drainage channels per Map 5. This language is located in Section 110, as well as on Map 5.	Section 110 Appendix C
Reference and provide Utah DEQ landfill permitting documents, including reclamation information. Ensure constancy in the discussion with DEQ.	The language for the landfill has been added to Section 106, 109, and 110; and the Landfill Permit documents have been included in Appendix N.	Section 106 Section 109 Section 110

		Appendix N
1) Provide a basis for the draindown time of 18 months. 2) Provide any operational findings on which draindown times are based, outputs of any draindown models, and more detailed assumptions related to the draindown rate. 3) Provide test column drainage or other information used as a basis for the draindown times.	1) Detailed data has been compiled from March 2020 through June 2020 while the mine was in an actual reclamation condition. This data has been summarized in the memo supporting the Heap Leach Closure Plan in Appendix I. 2) This is summarized in the same Memo referenced above. 3) This is summarized in a separate Memo also included in Appendix I.	Appendix I
Consistent with current best practices in most cases and conditional upon authorization of DWQ and BLM, the Division would be supportive of not rinsing the pad if the rest of the pad is properly reclaimed (e.g. proper capping etc.). Rinsing has been known to remove neutralization capacity in some heap leach pads. Based on the geochemistry of the ore, acid drainage appears to be unlikely, if long-term pad effluent is generated.	This has been noted. Per ongoing discussions with DWQ, the updated Ground Water Discharge Permit will include the Best Management Practices that has been provided by Dusty Early, DWQ Engineer, regarding capping the leach pad with 3’ of waste rock in lieu of rinsing. Further, the BLM has also expressed that Best Management Practices of capping with 3’ of waste in lieu of rinsing meets the requirements of the 1997 ROD for reclamation treatment plan. This is summarized in Section 110, as well as in Appendix I.	Section 110 Appendix I
The statement that the first year of rinse will determine whether lime rinsing will be needed should be qualified, since other factors will also need to be considered.	This language has been completely removed. Updated data on the heap leach closure and post closure is found in Appendix I. Further, the upward trend of pH during the March 2020 through June 2020 reclamation shows positive indication which supports the column testing and other data showing the ore continuing to contain sufficient acid neutralizing potential to neutralize the effluent as it is lessened as a function of draindown.	Appendix I
Clarify the source of the text in quotations	The source of the text in quotations was the 1997 ROD and GWDPA. These sources have been included.	Section 109
Some slopes on the north and east edges of the slope are between 2H:1V and 2.5H:1V. Update the text to reflect these slopes.	The text has been updated to qualify that there still exists areas of the leach pad with slopes steeper than 2.5H:1V.	Section 106,
Regarding the need for a clay liner	This has been confirmed by DOGM, DWQ, and BLM that a clay liner will not be used on the leach pad. Instead, 3’ of waste rock will be placed. This not only allows for a thicker growth buffer, but it also ensures consistency in spreading.	Section 110 Appendix I Appendix N
The Division has tried to ensure that its heap leach reclamation and closure comments are consistent with the interim reclamation/closure plans required by the DWQ. DWQ will also have specific requirements as part of its final reclamation/closure plan.	This is noted. As the GWDPA is submitted at the same time as this NOI, Appendix I of this submittal should be viewed as being supplied to both agencies concurrently. Therefore, as review commences, it should be done concurrently with both agencies.	Appendix I
Remove the statement that “upon closure all remaining solvents will be remediated through LVMC’s onsite hydrocarbon wetlands.”	This language has been removed.	
Appendix I – A draindown and evaporation timeline with the following water balance information may be needed: ● Annual inputs (e.g. annual infiltration of precipitation ● Annual outputs (e.g. evaporation from the heap surface, process solution pond surfaces, SX/EW facilities; any other losses) ● Recirculation rates (to heap and SX/EW facilities from ponds) ● Return rates (from heap and SX/EW facilities to ponds) ● Projected leaching rage (gpm) during mine life ● Projected maximum heap return rate (gpm) during mine life ● Estimated years of recirculation ● Estimated years required to complete evaporation	This information is detailed in Appendix I and the updated BAT plan. All of this information has been quantified and compared against the actual data compiled from March 2020 through June 2020.	Appendix I Appendix K

Appendix I – Depending on atmospheric conditions and infiltration of precipitation (which affects cover design and viability), long-term management of low flow heap leach effluent may be needed, such as by converting a process pond into an evapotranspiration (ET) cell. Include general details of an ET cell in the plan, based on your draindown analysis.	The details of an E cell (evaporation only) is found in Appendix I.	Appendix I
Surety – please use 2019 data costs.	The surety calculations have been updated with 2020 data costs.	Appendix N
Surety – The escalation factor for 2019 is 2.32% and the escalation period is for 5 years not 3 years.	The escalation factor has been updated for 2020 and the period is for five years.	Appendix N
Surety – Please use the Division's estimate of 15,484 tons or show supporting data for 25 pounds per square foot.	This has been updated with the Division's calculation.	Appendix N
Surety – Concrete to 6" thick mesh reinforced 02 41 13.17 5200 \$15.80/square yard. Concrete 7" – 24" please use reinforced 02 41 13.17 5500 \$169/cubic yard	These numbers have been updated to 2019 costs	Appendix N
Surety – The operator only lists three buildings for which demolition costs are given for floors and foundations. Pleas list demolition costs for floors and foundations for all buildings or state why they are exempt. Please note, building demolition costs specifically state they do not include foundations or dump fees.	Per conversations on June 2020, the Division and the Company have updated all demolition and structure data. This is now reflected in the updated surety.	Appendix N
Surety – The structures listed in the bonding sheet are not consistent with those listed in the surface facilities map dates 06/02/2017. Please update the demolition worksheets so that they correspond to surface facilities map. Also please make sure that the surface facilities maps are current.	All maps and facilities calculations are updated as of June 2020.	Appendix C 5 Appendix N
Surety – Please provide supporting data for the reclamation cost estimate. The Division needs productivity calculations for each activity. In addition the Division needs equipment, operating, and labor costs. The Division understands that LVMC is using programs from Caterpillar, but the Division must verify those costs. The Division usually uses BlueBook rental rates and R.S. Means. This information was not supplied in the June 6, 2017, submittal. Without that information the Division cannot do a full review of the reclamation cost estimate. While the comment on the review action says "Supporting Data has been supplied as a separate document," no such information could be found.	The surety documents have been completely updated since 2017. These include Productivity sheets per the equipment specifications. This data is found as the succeeding pages in the surety documents, and are actively linked to the entire surety document so that if one productivity amount changes, all cells throughout the surety that are linked to that piece of equipment are also updated automatically.	Appendix N
Surety – The reclamation plan says "All haul roads and roads not deemed essential by the BLM will be reclaimed. Roads located in soil substrate will be deep-ripped and re-seeded. Roads located on sandstone will be reclaimed by using an excavator to cast coarse material to match terrain." Previous comment: the reclamation cost estimate only has costs for loading/hauling/applying/spreading topsoil from stockpiles D and C. Without detailed cost estimates, the Division is unable to verify unit costs. In the cost estimate there are no costs for ripping or placing cast coarse material into sections of roads located on sandstone.	Map 5 shows the length of haul roads that are in sandstone and the haul roads that are in soil substrate. These haul roads are now split out in the Earthworks tab of the Surety spreadsheet.	Appendix N
Surety – Please use the Division worksheets that specifically list the monthly unit costs, hourly operating costs and 10% overhead and profit for equipment costs. The reason for this is that someone checking the data can see the numbers in Blue Book and they are on the worksheets. Otherwise the reader would have to find the Blue Book numbers and then do the calculations.	All spreadsheets are updated and show the 10% overhead, etc. Please note: all numbers are derived from RS Means Standard Union Rates.	Appendix N

Surety – The operator should have set up the bonding work sheets so that they directly correspond to the reclamation plan. Examples of inconstancy include, but are not limited to: the Centennial Pit is mentioned in the reclamation plan but not as a line item in the bonding worksheets; the Sentinal Pit is mentioned in the reclamation plan but not specifically mentioned in the bonding worksheets.	The text and the surety are not organized in such a manner that they cross-reference themselves to avoid confusion.	Section 110 Appendix N
HLP – Please include detailed information on heap leach pad decommissioning.	This data is now updated with actuals derived from March 2020 through June 2020. Please refer to Appendix I.	Appendix I
HLP – steeper slopes than 2.5H:1V have been measured	The language of the text acknowledges this.	Throughout
HLP – Please include detailed information on heap leach pad decommissioning.	This data is now updated with actuals derived from March 2020 through June 2020. Please refer to Appendix I.	Appendix I
The Division requires that the reclamation cost estimate and surety represent the point of maximum reclamation liability. The maximum current or planned heap leach draindown volume coincides with this maximum reclamation liability point, and must be included in cost estimate assumptions.	This is noted and acknowledged. The surety cost estimate takes the heap leach pad out to the maximum proposed capacity of 33MM tons.	Section 110 Appendix N
HLP – Identify the assumptions applied while calculating the total Solution Volume (such as cells C15 and E12). The retention of 33 percent of heap solution is considered high, based on typical heap leach pad residual water contents, so a more conservative number is needed. Identify pond capacities and include them in the total evaporation volume.	This data, especially the pond capacities, have been updated to reflect actuals derived from March 2020 through June 2020. These assumptions/knowns have then been extrapolated out to show the total proposed HLP storage capacity at 33MM tons of ore.	Section 110 Appendix I
HLP – DWQ will need to provide their concurrence with any plan not requiring neutralization of the leachate. Until then, the Division will need to require neutralization. Report the lime amount needed to neutralize the maximum leachate volume consistent with its nature, and provide neutralization information (e.g. lime slaking).	The data derived during the actual reclamation scenario of March 2020 through June 2020 shows a rise in pH. This indicates that, as shown in column testing and latent ore materials, there still exists an acid neutralizing condition within the HLP as a whole. In regard to DWQ's concurrence, as this NOI is being provided in conjunction with a GWDPA to DWQ, both agencies should consider this a cooperative action during review.	Appendix I Appendix K Appendix P
HLP – Change the … years over which the recirculation and evaporation is projected to occur, assuming the maximum process fluid volume and to be consistent with the evaporation schedule and water balance. Consider that recirculation will need to occur year round until solution pond inflows equal outflows without recirculation onto the heap.	This has been noted and the recirculation and evaporation data updated to reflect actual conditions seen during March 2020 and June 2020 and extrapolated out to seasonal effects.	Appendix I
HLP – Include the cost to purchase at least one pump … Current and reasonable quotes or data from a published cost handbook for a specified type of pump and piping of appropriate sizes and dimensions would be adequate. Divide this line into… pump and … pipes line. …Some pump and piping maintenance and/or replacement will be needed…	The cost for pumps is included in the Process Fluid Management Estimator.	Appendix I Appendix N
HLP – Provide a basis for the irrigation plumbing and the piping/pump maintenance. … Recirculation will need to occur year round for most of the draindown… Winter maintenance may be required.	This data has been updated with the Process Fluid Management Estimator.	Appendix I Appendix N
HLP – The Division understands that long-term flow from a heap leach pad is impossible to predict. Since treatment and/or evaporation of draindown flow is an important part of heap leach pad reclamation, a line item representing assumptions (e.g. pond area and volume) for passive evaporation of an estimated draindown flow rate is needed.	This data has been updated with the Heap Leach Draindown Estimator.	Appendix I Appendix N

	Surety – Please include detailed costs to remove and dispose of the surface facilities.	These costs have been updated in the Demolition tab.	Appendix N
	Process Area – Provide a list of solvents, storage tanks, and capacities.	These are now included in the newly formatted Demolition page.	Appendix N
	Comments from December 31, 2019, review need to be addressed. Several of the comments deal with the bond, and we are working on a new calculation which will include several assumptions. One of the main assumptions deals with what we are bonding: GTO expansion? Heap leach pad expansion?	All comments above this first asterisked comment are from the December 31, 2019 review. As seen, all comments have been addressed.	See above, 1
	Dump drainage designs.	These are included in Map 4, and commitment for the installation of the drainages for Dump C and Dump B is to be performed 2021.	Appendix C Section 106,
	Need to include the pond near the GTO Pit	This has now been included in the updated Table X	Section 109 Appendix N
	Heap leach pad closure design which will need to be approved by the BLM and DWQ. Also need a plan to handle drainage from the heap leach.	This data has been thoroughly updated as seen in Appendix I, Appendix N, and Appendix P	Appendix I Appendix N Appendix P
	Landfill not currently bonded, and it's not certain whether the cost can be included with regrading Dump A or if additional costs need to be added.	The Landfill is a line item in the Earthwork Tab.	Appendix N
	NOI needs to be updated based on experience with draindown.	This has been done, as detailed in Comments 1-38 above.	
	Plan for post-closure fluid management.	An E-cell has been preliminarily designed and included in the NOI text, Appendix I, and Appendix N.	Section 110 Appendix I Appendix N
	Provide an updated as-built aerial photo labeling all facilities/equipment/etc. and reference this back to the surety pages.	This is now included in Appendix C, Map 2 – Existing vegetation and surface conditions	Appendix C

Introduction Table 2 – Key Factors & List of Commitments

Estimated mine life = 16 years

HLP = 192 acres

committed to re-grading slopes steeper than 2.5H:1V as needed.

Average height not to exceed 75’

2020 current average height = 57’

Waste Dump A = 129 acres

committed to re-grading slopes steeper than 2.5H:1V 2021

Waste Dump B = 135 acres

committed to regrading/reclaiming 2020/2021

Waste Dump C = 157 acres

committed to drainage installation 2021

GTO Pit = 35 acres

Centennial Pit = 174 acres

Will at any time have a total void space of 275,000 cy that would need to be backfilled above 6,200’.

The onsite Class IVb landfill will be monitored to ensure that post-mining capacity will remain for the use of the landfill for disposal of all demolished structures, equipment, etc. during final closure activities. Estimated Cubic yardage of demolition debris to be disposed of in the onsite landfill is 20,000 cubic yards.

3809.401 Plan of Operations Checklist

Operator Information Requirements - 3809.401(b)(1)

❑ Name, address, phone, taxpayer identification number – *See Section R647-4-104*

❑ BLM serial number of involved unpatented claims – *See Section R647-4-104*

❑ Point of contact for corporations – *See Section R647-4-104*

❑ 30-day notification required for any change in operator – *See General Information*

Description of Operations Elements - 3809.401(b)(2)

❑ Maps showing all activity and facility locations – *See Appendix C*

❑ Preliminary designs and operating plans – *See Appendix C*

❑ Water management plans – *See R647-4-106.8 & R647-4-109.1*

❑ Rock characterization and handling plans – *See R647-4-106.9 & R647-4-109.5*

❑ Quality assurance plans – *See R647-4-109.5*

❑ Spill contingency plans – *See R647-4-109.5*

❑ Schedule of operations from start through closure – *See R647-4-102*

❑ Plans for access, power, water, or support services – *See R647-4-106.2*

Reclamation Plan Requirements - 3809.401(b)(3)

❑ Drill-hole plugging plans – *See R647-4-108*

❑ Regrading and reshaping plans – *See R647-4-110.2*

❑ Mine reclamation, with pit backfilling information – *See R647-4-110*

❑ Riparian mitigation plans – *Not applicable*

❑ Plans for wildlife habitat rehabilitation – *See R647-4-110.5*

❑ Topsoil handling plans – *See R647-4-110.5*

❑ Revegetation plans – *See R647-4-110.5*

❑ Plans to isolate and control toxic or deleterious material – *See R647-4-110.4*

❑ Plans to remove/stabilize buildings, structures, and facilities – *See R647-4-110.3*

❑ Provisions for post-closure management – *See R647-4-110.3*

Monitoring Plan Requirements - 3809.401(b)(4)

❑ Description of resources subject to monitoring plans – *See R647-4-109.5*

❑ Type and location of monitoring devices – *See R647-4-109.5 & Appendix C*

❑ Sampling parameters and frequency – *See R647-4-109.5*

❑ Analytical methods – *See R647-4-109.5*

❑ Reporting procedures – *See R647-4-109.5*

❑ Procedures for responding to adverse monitoring results – *See R647-4-109.5*

❑ Reliance on other Federal or State monitoring plans – *See R647-4-109.5*

Interim Management Plan - 3809.401(b)(5)

❑ Measures to stabilize excavations and workings – *See Appendix P*

❑ Measures to isolate or control toxic or deleterious materials – *See Appendix P*

❑ Plan for storage or removal of: equipment, supplies, structures – *See Appendix P & Appendix N*

❑ Measures to maintain the area in a safe and clean condition – *See Appendix P*

❑ Plans for monitoring site conditions during non-operation – *See Appendix P*

❑ Schedule of anticipated non-operation – *See Appendix P*

❑ Provisions to notify BLM of changes in non-operation period – *See Appendix P*

Table of Contents

Appendices

R647-4-101 Filing Requirements and Review Procedures

Lisbon Valley Mining Company, LLC (Company) intends to operate an open-pit copper mine (Lisbon Valley Copper Mine (LVCM)), and a heap leach facility located approximately 18 miles southeast of La Sal, Utah, in San Juan County. The Company will produce cathode copper using a solvent extraction electrowinning process (SX-EW).

The Company has reviewed and understands section 101 of R-646-4.

R647-4-102 Duration of the Notice of Intention

The Company understands that this NOI including any subsequently approved amendments or revisions remains in effect for the life of the mine. The Company considers the life of the mine to be the end of mining and processing activities. The estimated life of the mine is 16 years.

R647-4-103 Notice of Intention to Commence Large Mining Operations

The Company has prepared this Notice of Intent (NOI) in accordance with R647-4-103 of the Utah Administrative Code. The NOI addresses the following requirements:

- R647-4-104 Operator(s), Surface and Mineral Owner(s)
- R647-4-105 Maps, Drawings and Photographs
- R647-4-106 Operation Plan
- R647-4-108 Hole Plugging Requirements
- R647-4-109 Impact Assessment
- R647-4-110 Reclamation Plan
- R647-4-112 Variance

R647-4-104 Operator(s), Surface and Mineral Owner(s)

104.1 Operator Information

Company Information

Lisbon Valley Mining Company, LLC
PO Box 400
Moab, UT 84532
Phone: 435-686-9950
Fax: 435-686-2223
Website: www.lisbonmine.net

Mine Information

Lisbon Valley Copper Mine (LVCM)
920 South Country Road 313
La Sal, UT 84532

Registered Utah Agent

Ken Garnett
11 Edgewater Drive
Old Greenwich, CT 06870
Phone: 203-249-4125
ken.garnett@gmail.com

Delegation of Authority

Ken Garnett
11 Edgewater Drive
Old Greenwich, CT 06870
Phone: 203-249-4125
ken.garnett@gmail.com

104.2 Surface & Mineral Landowners

Surface Landowners:

- Lisbon Valley Mining Company, LLC
  PO Box 400
  Moab, UT 84532
  435-686-9950

- Bureau of Land Management (BLM)
  Moab District Office, 82 East Dogwood
  Moab, UT 84532
  435-259-2100

- State of Utah, School and Institutional Trust Lands Administration (SITLA)
  675 East 500 South, Suite 500
  Salt Lake City, UT 84102
  801-538-5100

Mineral Owners:

- Lisbon Valley Mining Company, LLC
  PO Box 400
  Moab, UT 84532
  435-686-9950

- Bureau of Land Management (BLM)
  Moab District Office, 82 East Dogwood
  Moab, UT 84532
  435-259-2100

- State of Utah, School and Institutional Trust Lands Administration (SITLA)
  675 East 500 South, Suite 500
  Salt Lake City, UT 84102
  801-538-5100

- Steve & Mary Lou Kosanke
  PO Box 8164
  Hualapai, AZ 86412

- Lisbon Copper Ltd.
  C/O Raymond Kunkel
  6503 South 1090 West
  Murray, UT 84111

- Tintic Uranium
  1111 Walker Center
  Salt Lake City, UT 84111

- JF and Joyce Costanza
  484 Sundial
  Moab, UT 84532

- Boyd C Brinton
  677 Holiday Drive
  Brigham City, UT 84302

- Suzanne Brinton Strong
  1039 Vista View
  Salt Lake City, UT 84108

- Marva K Loebe
  2 Lakeshore Dr.
  Salem, SC 29676

- Carole L Steel
  611 Fenimore St.
  Winston Salem, NC 27103

104.3 Claim & Permit Information

Federal mining claim number(s), lease number(s), or permit number(s) & State mining claim number(s), lease number(s), or permit number(s):

Ownership	Contract type	Identification	Description
State DOGM	Permit	M/037/0088	Large Mining Operations Permit
Federal BLM	BLM File	UTU72499	BLM File Number
State SITLA	Lease	ML 17661	Section 36 30S / 25E
State SITLA	Lease	ML 20569	Section 36 30S / 25E
State SITLA	Lease	ML 53127	Section 32 30S / 26E
BLM	Unpatented Claims	Multiple	See Appendix A

Table 1

BLM unpatented claims are located in Appendix A.

R647-4-105 Maps, Drawings & Photographs

105.1 - Topographic base map, boundaries, pre-act disturbance

Refer to Map 1 in Appendix C

105.2 - Surface facilities map

Refer to Map 2 in Appendix C

105.3 – Drawings or Cross Sections (slopes, roads, pads, etc,)

Refer to Figures 1-6 in Appendix C

105.4 – Photographs

Refer to Appendix B

R647-4-106 Operation Plan

The operator shall provide a narrative description referencing maps or drawings as necessary, of the proposed operations including:

106.1 - Minerals mined

LVCM is a copper mine; while other metals are incidentally mined, they are not in significant enough quantities to be economic or pose a risk.

106.2 - Type of operations conducted, mining method, processing etc.

Open pit mining has been performed within the active mine plan boundary as approved in the 1997 ROD since 2005. Since 2005, four open pits were mined (Map 1):

Sentinal East (now completely backfilled and covered by Waste Dump C)

Sentinal West (mined out to an ultimate post-mining pit floor elevation of 6,220 ft amsl, but remaining open for use as a source of riprap material for drainage installation on dumps and other areas within the active mine plan boundary)

Centennial Pit (still considered active, and proposed for continued mining with an ultimate pit floor elevation of 6,166 ft amsl; which will be backfilled up to 6,200 ft amsl for post-mining reclamation) (Map 2)

GTO Pit (still considered active, and proposed for continued mining with an ultimate pit floor elevation of 6,102 ft amsl) (Map 2)

The Company intends to operate a traditional open-pit copper mine with a heap leach pad, solvent extraction, and electrowinning processing plant. The final product is a 99.99% pure copper cathode with many commercial uses.

Mining Operation

Open Pit Mining

The Company will remove rock from the active mine area by drilling and blasting. The pits will develop in phases. Mining may extend into the next phase before the current phase is complete, to maximize safety and meet production needs. All haul roads are within the project boundary.

Ore is drilled and then blasted to an acceptable fragmentation from 20' deep benches. The ore is then loaded and transported to the heap leach pad using conventional front end loaders and haul trucks. Waste rock is handled in accordance with the Waste Rock Management Plan found in Appendix D. Waste rock is hauled to Waste Dump A or to the Centennial Pit backfill using the same methods and equipment.

A small landfill is located on Waste Dump A and is approved for use by the Utah Division of Waste Management and Radiation Control. The landfill is designated as a Class IVb under Permit #1902, and is regulated by UAC R315-301 through 320. The maximum footprint of the landfill is less than five acres, is located completely on SITLA land, and will be contained completely within the existing footprint of Waste Dump A. A copy of the Approved Permit Application and Class IVb Solid Waste Permit is included in Appendix D as part of the Waste Rock Management Plan.

The Company contracts drilling and blasting. The drilling contractors use a fleet of conventional 6.75

linch rotary drills. The blasting contractor uses an ammonium nitrate/fuel oil (AN/FO) explosive. Blast hole depth is 20' and spaced 15-20'.

Haul roads average 80' in width with maximum 10 degree ramps. Refer to Map 2 in Appendix C.

Summary of Mine Plan Amendments

The LVCM initiated open-pit mining operations in 2005 following an approved NOI for Large Mining Operations. Including the 2016 NOI Revision there are seven mine plan amendments authorized between 2007 and 2016. The amendments are listed below and tabulated as a function of cumulative changes and disturbance trade accounting in Table 2. It should be noted that Table 2 only shows mine plan amendments as it relates to leach pad, open pit and waste dump disturbances. Process areas and pond disturbance is reflected in Table 6.

	Mining Volumes Cubic Yard (CY)		Disturbance (acres)			
	Ore	Waste	Pits	Dumps	Leach Pad	Total Mine
Proposed Action	32.8M	65M	231	394	266	1103
2007 Amended Plan	28.7M	64.8M	255	376	266	1109
Centennial Expansion						
ILS Pond						
2010 Approved Amendment	28.7M	64.8M	255	373	266	1106
Backfill Sentinel East Pit						
2011 Approved Amendment	28.7M	64.8M	254	371	266	1104
Expand Dump C Reduce Dump B						
Haul Road from GTO Pit						
2012 Approved Amendment	28.7M	64.8M	254	442	266	1177
Expand Dump B						
2015 Approved Amendment	28.7M	64.8M	254	442	266	1177
Beds 14 & 15 Centennial Pit Backfill						
2015 Approved Amendment	28.7M	64.8M	254	442	266	1177
Additional Backfill Materials						
2016 NOI Amendments						

Pit expansions, gas line relocation, Leach Pad Powerline, Leach Pad Acid Tanks, GTO Drainage, B-Dump Expansion, PW-13	33.6M	109.3M	360	447	266	1232
2020 NOI Mine Plan						
Minor expansion of Centennial Pit, continued mining in GTO, elevated haul road on leach pad	33.6M	109.3M	282~~66~~	423	212~~192~~	917~~88~~1
Adjustment between 2016 & 2020 Plan	0%	0%	-2~~6~~2%	-5%	-20~~8~~%	-26~~8~~%

Table 2

Cumulative Changes to Mine Plan 2007 - 2016

1) Centennial/ILS/Stage IV Revision - 2007[1]
2) Sentinel East Pit Backfilling - 2009[2]
3) Dump C Expansion/Dump B Reduction - 2011[3]
4) Haul Road from GTO Pit - 2011a[4]
5) B Dump Expansion - 2013[5]
6) Phase II B Dump Expansion - 2013a[6]

The reason for the decrease in proposed disturbance for the pits and dumps is due to optimized pit planning and ability to dispose of more mined waste during pit backfilling. The decrease in proposed disturbance for the leach pad is due to the optimized design of the elevated haul road on the south portion of the pad, as well as better understanding of fluid control.

[1] LVMC 2007 Summary of Proposed Mine Plan Amendments. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 19 Feb 2007.

[2] LVMC 2009 Proposed Mine Plan Amendment. Sentinel East Backfilling. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 24 April 2009.

[3] LVMC 2010 Proposed Mine Plan Amendment. Dump C Expansion/Dump B Reduction. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 29 Oct 2010.

[4] LVMC 2010a Proposed Design Revision for Mine Plan Amendment. Haul Road from GTO Pit. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 14 Dec 2010.

[5] LVMC 2013 Proposed Mine Plan Amendment - B Dump Expansion Lisbon Valley Mining Company LLC, 920 South County Road 313La Sal, Utah 84530, DOGM Permit M/037/088 5 July 2010.

[6] LVMC 2013a Revision 1 - Proposed Mine Plan Amendment - B Dump Expansion Phase II - Lisbon Valley Mining Company LLC, 920 South County Road 313 La Sal, Utah 84530, DOGM Permit M/037/088.

The Company's mine fleet is detailed below in Table 3.

Type of Equipment	Use
40 ton haul trucks	Mining and general construction
50 ton haul trucks	Mining
100 ton haul trucks	Mining
Excavators	Mining and general site maintenance
Loaders & backhoes	Mining and general site maintenance
Dozers	Mining and general site maintenance
Fork Lifts	General site maintenance
Skid steers	General site maintenance
Fuel trucks, lube trucks, maintenance vehicles	General site maintenance
Light vehicles	General site maintenance & supervision

¶

~~Unit #~~	~~Description~~	~~Serial Number~~	~~Model~~	~~Manufacturer~~
~~100~~	~~14M Blade~~	~~LB9J00463~~	~~14M~~	~~Caterpillar~~
~~207~~	~~Haul Truck~~	~~ORDR00122~~	~~777G~~	~~Caterpillar~~
~~208~~	~~Haul Truck~~	~~ORDR00123~~	~~777G~~	~~Caterpillar~~
~~218~~	~~Haul Truck~~	~~JRP01400~~	~~777F~~	~~Caterpillar~~
~~219~~	~~Haul Truck~~	~~JRP01401~~	~~777F~~	~~Caterpillar~~
~~209~~	~~Haul Truck~~	~~EED00425~~	~~773F~~	~~Caterpillar~~
~~210~~	~~Haul Truck~~	~~EED00431~~	~~773F~~	~~Caterpillar~~
~~211~~	~~Haul Truck~~	~~EED00432~~	~~773F~~	~~Caterpillar~~
~~220~~	~~Water Truck~~	~~1X03427~~	~~769C~~	~~Caterpillar~~

222	Water Truck	2FZNRKBBXAB52467	4200-WT	Sterling
304	Loader	70C55075	70ZV-2	Kawasaki
305	Wheel Loader	1X03427	992K	Caterpillar
306	Wheel Loader	HR00141	992G	Caterpillar
388	Man-lift	31760	600S	JLG
400	Track Dozer	ABK01068	D9R	Caterpillar
401	Track Dozer	MRT00256	D6	Caterpillar
402	Track Dozer	3SK00530	D10N	Caterpillar
450	Excavator	K6J72068	330LX	Linkbelt
451	Mini-Excavator	8722	PC78USLC	Komatsu
452	Excavator	FF017VA006307	EX800	Hitachi
600	Light Truck	1FTNF21555EC16219	F250	FORD
601	Light Truck	1FTNF21575EC03746	F250	FORD
602	Light Truck	1FTNF21535EC25436	F250	FORD
603	Light Truck	1FTNF21555EC45302	F250	FORD
605	Light Truck	1FTNF21535EC43497	F250	FORD
606	Light Truck	1FMFU16L23LC47055	F150	FORD
608	Light Truck	1FTF14W76NA24530	F150	FORD
609	Light Truck	1FTNF21566EC20880	F250	FORD
612	Light Truck	1FTBW14V19KC83292	F150	FORD
613	Light Truck	1FTFW1EVEAFB85191	F150	FORD
614	Light Truck	1FTFW1EV3AKB59328	F150	FORD
615	Light Truck	1FTFW1EV5AFB65768	F150	FORD
616	Light Truck	1FTFW1EV5AFC23958	F150	FORD
617	Light Truck	1FTPW14VX9KC72467	F150	FORD
619	Light Truck	1FTFW1EV1AKE32136	F150	FORD
620	Light Truck	1FMNU41SX3EB44210	LIMO	FORD
621	Light Truck	1FTFW1EV2AFD79665	F150	FORD
622	Light Truck	1FTW1EF9BFA42775	F150	FORD
623	Light Truck	1FTFW1EF8BKD44179	F150	FORD
624	Light Truck	1FTFW1ET9BFB44258	F150	FORD
625	Light Truck	1FTFW1EFXBFA42784	F150	FORD
627	Light Truck	1FTWW31RX8ED06712	F150	FORD
628	Light Truck		F250	FORD
629	Light Truck		F250	FORD

~~630~~	~~Light Truck~~		~~F250~~	~~FORD~~
~~631~~	~~Light Truck~~		~~F250~~	~~FORD~~
~~632~~	~~Light Truck~~		~~F150~~	~~FORD~~
~~650~~	~~Light Truck~~	~~1FTRF14W65KE69759~~	~~F150~~	~~FORD~~
~~651~~	~~Light Truck~~	~~1FTRF14W95NB75318~~	~~F150~~	~~FORD~~
~~652~~	~~Light Truck~~	~~1FTRF14W55KE69767~~	~~F150~~	~~FORD~~
~~653~~	~~Light Truck~~	~~1FTRF14W55NB75333~~	~~F150~~	~~FORD~~
~~654~~	~~Light Truck~~	~~1FTRF14W15KE69765~~	~~F150~~	~~FORD~~
~~655~~	~~Light Truck~~	~~1FTRF14WX5NB75313~~	~~F150~~	~~FORD~~
~~656~~	~~Light Truck~~	~~1FTRF14W96NA24528~~	~~F150~~	~~FORD~~
~~701~~	~~Leach Pad Aeration~~	~~5893073~~	~~G25~~	~~Wacker Neuson~~
~~702~~	~~Tank House Back-Up~~	~~70142~~	~~VTA28G2~~	~~Cummins~~
~~703~~	~~EW Stand-by~~	~~75530/4~~	~~G2331175596~~	~~Cummins~~
~~704~~	~~Fusion Machine~~	~~4BTA3~~	~~9GT5~~	~~Cummins~~
~~705~~	~~RAF Stand-by~~	~~1GZ00544~~	~~3512~~	~~CAT~~
~~706~~	~~Process back-up~~	~~6EJ01093~~	~~3512~~	~~CAT~~
~~707~~	~~Water well~~	~~MMG55~~		~~Magnum~~
~~708~~	~~Water well~~	~~MQ~~		~~Wisper Watt~~
~~709~~	~~Portable~~		~~60127756~~	~~I.R.~~
~~800~~	~~International Service~~	~~1FDXX47P95EC03771~~		
~~802~~	~~Maintenance~~	~~1FDXX47P95EC03771~~	~~F450~~	~~FORD~~
~~803~~	~~Shop Service Truck~~	~~1HTSCAAM6SH652586~~	~~4700~~	~~International~~
~~804~~				
~~820~~	~~Komatsu 1020-5~~	~~TF00233~~	~~1020-5~~	~~Komatsu~~
~~830~~	~~TailLift 35~~	~~318216B~~	~~35~~	~~TailLift~~
~~831~~	~~TailLift 35~~	~~318217B~~	~~35~~	~~TailLift~~
~~832~~	~~TailLift 35~~	~~322119B~~	~~35~~	~~TailLift~~
~~834~~	~~Extenda Boom Lift~~	~~12H40JV0450232~~	~~DL12H-40~~	~~H&E~~
~~835~~	~~Extenda Boom Lift~~	~~12H40JU0750211~~	~~DL12H-40~~	~~H&E~~
~~844~~	~~Prowler~~	~~4UF11MPV68T303353~~	~~XTX~~	~~Artic Cat~~
~~845~~	~~Prowler~~	~~4UF11MPVCBT301296~~	~~XTX~~	~~Artic Cat~~
~~850~~	~~International 4700~~	~~1HTSCABP4YH2984~~	~~4700~~	
~~851~~	~~Grove 65T~~	~~66381~~	~~RT865~~	~~Grove~~

Table 3

Waste Rock Management Plan

The Company manages waste rock per the Waste Rock Management Plan approved February 12, 2014. The Waste Rock Management Plan which includes a detailed discussion of waste rock characteristics is attached as Appendix D.

Refer to Map 1 in Appendix C for Waste dump locations. Waste dump capacities are detailed in Table 4.

Dump	Proposed Final Acres	Remaining capacity (MM tons)	LOM Volume (MM tons)
A	129	31	35
B	137	0	20
C	157	0	40
Totals	423	31	95

Table 4

Waste dump A is designed to cover 129 acres and receive 31MM tons of waste to an elevation of 6880' above mean sea level (AMSL). Waste Dump B has been completed, with a total acreage of 137 acres. This waste dump is scheduled for reclamation in 2020-2021. Waste Dump C has been completed, with a total acreage of 157 acres. This waste dump underwent concurrent reclamation between 2012 and 2016. Installation of drainage controls is scheduled to take place in 2021. Refer to Figures 4, 5, 6 in Appendix C.

The Company has identified beds 3-10 as Uncertain if they would produce acid through acid-base accounting testing. These waste beds are encapsulated within Likely Acid Neutralizing waste within the waste dumps or within authorized backfill areas of the Centennial Pit. To date, the Company has placed approximately 56,000 tons of 3-10 waste material in the Centennial pit (see Waste Rock Management Plan), all of which was placed above the elevation of 6,200 ft amsl. Maps illustrating the encapsulation are located within the annual data updates to the Waste Rock Management Plan attached as Appendix D. Further detail regarding waste rock characteristics including Acid Base Accounting results and Meteoric Water Mobility Testing are located within the Waste Rock Management Plan and the annual data updates attached as Appendix D.

The Centennial Pit will be backfilled during the mining process. The pit will be backfilled to cover the pre-mine groundwater elevation of 6190' AMSL. Further details regarding Centennial Pit Backfilling are provided in Section 106.9.1.

The Company commits to following the stipulations of the existing Environmental Assessment for the treatment of waste material as it relates to pit backfilling and waste dump placement.

Heap Leach and Ponds Operations

The leach pad is designed to contain up to 33MM tons of ore and to route solution to the ponds via gravity drainage. As of 2020, 25MM tons of ore has been placed on the leach pad, with a total footprint of approximately 192 acres. The remaining ore to be placed is 8MM tons. The remaining ore to be placed will be placed on the existing 192-acre leach pad footprint, which has been optimized to include the elevated haul road design portion. Details on the elevated haul road are found in Appendix C, Map 6. The elevated haul road would increase the lined and proposed stacking area of the leach pad by 20 acres. This would give a total post-mining leach pad footprint of 212 acres, and a total capacity of 8MM tons.

Initially, on stacking of the first lift, material was crushed to minus 2” and ‘agglomerated’ prior to placement on retreats 1-2. However, the nature of the material was such that the crushing and agglomeration led to increased clays and decreased the total leachability of the ore. The remaining leach pad was stacked as run of mine material. The plan for future ore placement is to crush oversize material to less than 6” prior to placement. fines generated during the crushing will be stockpiled separately to use as ‘sand’ material during the construction of the ET cells.

The leach pad has a perimeter berm and is graded to follow the natural topography of the valley. The leach pad’s drainage follows accordingly in a northern and easterly direction with the solution ponds located at the northeast corner. Refer to Map 1, Map 2, Map 4, the Company’s SWPPP, and Map 5 in Appendix C. Also refer to Figure 8 in Appendix C. The solution collection ditch is constructed along the north edge of the pad and drains by gravity to the solution ponds.

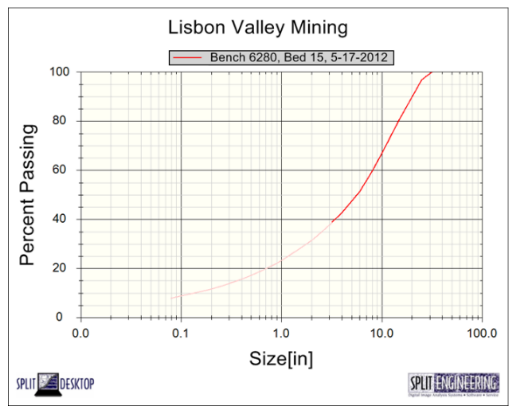
The ore stacked on the leach pad is in multiple lifts ranging from 10- 36’ in vertical height. The first lift is offset from the edge of the leach pad a minimum of 10’ to provide a buffer zone between the toe of the lift and the edge of the lined leach pad. Subsequent lifts are set back, with the intention of creating terraces that allow for an overall operational slope of 2.5H:1V. The terraces will be filled in by pushing the leached material to create a final continuous slope of 2.5H:1V for final reclamation. Reference section 110.2.5 Dumps, Heap Leach Pads, Solution and Storm water Ponds for additional details on leach pad reclamation. Some areas of the heap leach pad are in the process of being re-graded to an operational slope of 2.5H:1V. Therefore, as of the date of this submission, there may be areas of the existing heap leach pad that have current operational slopes steeper than 2.5H:1V. The Company commits to re-working these steeper slopes to ensure a feasible reclamation slope angle of 2.5H:1V as the leach pad continues to be constructed. The operational slope angles take into account the ability to push, especially to the north, to fill in the existing pipe ditch, without having to add additional liner beyond the current lined area. The slope of the top of the heap is kept relatively flat in order to ensure consistent and homogeneous spread of effluent for an enhanced leaching process.

As stated above, c~~C~~onstruction of the leach pad initially included placement of minus 2” crushed rock for retreats 1-2. ~~The lower-most lifts of the leach pad consist of the minus 2” crushed rock.~~ In recent years the operation halted crushing and the existing upper lifts consist of run-of-mine material. Average size distribution of the run-of-mine material ranges from 2’ to minus 1/4”. Starting in late 2018, ore has been crushed to minus 6” prior to placement on the heap leach pad. Due to the variation in ore sizes, especially with the lower-most lifts, constant monitoring of the lower lifts are performed by the in-house surveyor and operations personnel.

Split Engineering is employed to gain a better understanding of the ore’s size fractions. Photos of the dig face are taken with scaling balls (as seen below) and those photos are analyzed for size fractions using computer engineering software.

The data produced is graphed showing the curve of the size fractions.

	Bench 6280, Bed 15, 5-17-2012	IMG_0002	IMG_0003	IMG_0001
Size[in]	% Passing	% Passing	% Passing	% Passing
50	100	100	100	100
25	96.85	97.32	94.03	100
15	80.63	76.24	70.93	99.83
10	66.64	58.7	56.92	90.81
8	59.32	50.46	51.78	81.84
6	51.24	41.86	46.45	70.73
4	42.58	33.26	40.17	58.75
2	31.57	21.85	32.14	44.28
1	23.33	14.34	25.5	32.89
0.75	20.61	12.03	23.15	29.05
0.5	17.31	9.39	20.2	24.38
0.38	15.31	7.87	18.34	21.53
0.25	12.89	6.14	15.99	18.05
0.19	11.4	5.14	14.5	15.91
0.08	7.96	3.01	10.84	10.93



Retreats are oriented north/south and are approximately 220’ wide. The max proposed height of the heap leach pad is 100’ on the eastern-most extent, and 50’ on the western-most extent. The average height of the heap leach pad will be 75’. As of 2020, the average height of the heap leach pad is 57’.

The proposed stacking plan would fill in the existing ‘bowl’ located in the central portion of the leach pad, effectively bringing the eastern half of the leach pad to a relatively flat plane. Once the eastern half of the leach pad is relatively flat, and the elevated haul road has expanded the leach pad southward, all remaining ore will be placed on the western half of the leach pad, which is currently at an average height of 30’. The western half of the leach pad will have a final post-mining elevation of slightly higher than the eastern half. This stacking plan will ensure post-mining drainage is toward the process and 100-yr ponds.

The heap leach pad liner system is comprised of 1’ of compacted low permeability soil overlain by 80-mil thick high-density polyethylene (HDPE) or linear low-density polyethylene (LLDPE) plastic. The plastic sheets are welded together to form a continuous impermeable synthetic liner.

A grid of solution collection pipes spaced approximately 20 to 30’ apart is installed over the synthetic liner to enhance drainage and reduce head pressures over the liner. The pipes are designed to control the hydraulic head up to about 1’.

Copper stacked on the leach pad is leached from the ore using a sulfuric acid solution in concentrations ranging from 2 to 200 grams/liter (g/L) acid. The barren acid solution is termed raffinate (RAFF). RAFF is applied to the ore using conventional drip lines at an application rate ranging from 0.001-0.004 gallons per minute per square ft (GPM/ft^2). The resultant liquor is composed largely of copper sulfate and is termed intermediate leachate solution (ILS). The ILS is contained in an artificially lined pond. To build copper concentration within the solution ILS is recirculated back onto the ore. Once the recirculated liquor reaches an acceptable copper concentration, the liquor is termed pregnant leachate solution (PLS). The PLS is contained in an artificially lined PLS pond then pumped to the solvent extraction/electro winning (SX/EW) facility.

The Company will use four ponds for processing; pre-RAFF, RAFF, ILS, and PLS. The Company maintains two ponds for storm water management; storm water and an emergency overflow.

The heap leach pad and process ponds construction drawings (Stages 1-3 + elevated haul road) is compiled in a series of drawings. Refer to Figures 8, 9 and 10 located in Appendix C.

Upon closure, the spent ore from the heap leach processing will be left in place on the heap leach pad. The reclamation process for the heap leach pad includes draining the leach pad down, pushing slopes down,3' of crushed rock, and 12" of growth media applied and subsequent re-vegetation.

Solvent Extraction and Electrowinning

The PLS is pumped from the PLS pond to the Solvent Extraction facility. The solvent extraction facility uses a large mixing tank to stir the PLS and oil based copper extraction fluid termed organic. When the two solutions are mixed the PLS releases its copper to the organic, the resulting solutions are RAFF and loaded organic. The RAFF is routed back to a RAFF pond to be returned to the leach pad circuit to continue extracting copper. The loaded organic is routed to another large mixing tank. This mixing tank stirs the loaded organic with a lean electrolyte. When the two solutions are mixed the loaded organic releases its copper to the lean electrolyte and the resulting solutions are organic and rich electrolyte. The organic solution is returned to the PLS mixing tank for copper extraction. The rich electrolyte is routed to the electrowinning facility. The electrowinning facility circulates the rich electrolyte through tanks with stainless steel cathodes and lead anodes. An electrical current is applied across the cathodes and anodes. The resulting products from this process are high grade cathode copper plates and lean electrolyte. During the plating process the lead anodes oxidize and produce a byproduct called lead flake at approximately a rate of .5% of cathode production. A film called "crud" can form and float on the top of the cells. This is due to very fine silt mixing with the organic, electrolyte and forming an emulsion. Crud is produced at a very low rate, however, large precipitation events can temporarily increase the production rate. The lean electrolyte is returned to the loaded organic mixer to extract copper. The lead flake is extracted from the bottoms of the tanks, loaded into barrels and shipped to a recycler. Crud is extracted through a filtering process, loaded into trucks and deposited on the leach pad for further beneficiation. The copper cathode plates are weighed, banded and prepped for shipment to the customer.

The effluent flow to the heap leach pad averaged 11,500 gpm from 2016-2020. The maximum effluent flow that was sent to the leach pad was 13,600 gpm, which occurred during the months of February and April. The lowest effluent flow that was sent to the leach pad was 7,400 gpm, which occurred during the months of December and January.

Use and Occupancy

The Company's occupancy of federal land is incident to mining, mineral processing and cathode copper production. The equipment required for this project include heap leach pad, process ponds, solvent extraction, and electrowinning facilities which are constantly supervised for safe and efficient operation. The processing facilities are fenced and gated restricting access to the site for the protection of public safety, employee safety, immobile processing equipment, and valuable copper cathodes.

The Company's operations do not limit access to adjacent public lands. Existing roads provide access to adjacent public lands. The Little Valley Road is immediately north of the site travels east and west. The Lisbon Valley Road (also known as Country Road 313) passes through the site and travels north and south. Island Mesa Road is immediately to the southeast and travels east and west. East Lisbon Valley Road is a turn off Island Mesa Road immediately south of the mine site traveling northwest and southeast.

Section 110.3 address's the reclamation of surface facilities.

Concurrent Reclamation

The Company will conduct concurrent reclamation as stipulated by R647-107.6. Reclamation is discussed in detail in Section 110.

106.3 - Estimated acreages disturbed, reclaimed, annually

The current disturbance, as of June 2020, is 1,066 ~~984~~ acres. The current disturbance is detailed in Table 5. Disturbance anticipated in this Notice is detailed in Table 6. The Company commits to completing partial reclamation concurrent with operations, as stipulated by R647-107.6.

Facility	2016 Disturbance Acreages			Totals
Land Ownership	**BLM**	**SITLA**	**Fee (Private)**	
Centennial Pit	113	71	0	184
Sentinel West Pit	38	0	0	38
GTO Pit	0	50	10	60
Waste Dump C	157	0	0	157
Waste Dump B	0	137	0	137
Waste Dump A	41	36	0	77
Leach Pad	32	0	160	192
Process Ponds-PLS, ILS, RAFF, Storm water & Emergency Overflow	0	0	36	36
Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Administration	61	0	0	61
Freshwater Ponds & Laydown Areas	0	0	30	30
Haul Roads	19	24	23	66
Reclamation Stockpiles	4	11	13	28
Total Project Related Disturbance	465	329	272	1066

~~Facility~~	~~Current Disturbance Acreages~~			~~Totals~~
~~Land Ownership~~	~~BLM~~	~~SITLA~~	~~Fee (Private)~~	

~~Centennial Pit~~	~~103~~	~~71~~	~~0~~	~~174~~
~~Sentinel West Pit~~	~~38~~	~~0~~	~~0~~	~~38~~
~~GTO Pit~~	~~0~~	~~33~~	~~2~~	~~35~~
~~Waste Dump C~~	~~157~~	~~0~~	~~0~~	~~157~~
~~Waste Dump B~~	~~0~~	~~137~~	~~0~~	~~137~~
~~Waste Dump A~~	~~41~~	~~36~~	~~0~~	~~77~~
~~Leach Pad~~	~~32~~	~~0~~	~~160~~	~~192~~
~~Process Ponds-PLS, ILS, RAFF, Storm water & Emergency Overflow~~	~~0~~	~~0~~	~~29~~	~~29~~
~~Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Administration~~	~~61~~	~~0~~	~~0~~	~~61~~
~~Haul Roads~~	~~19~~	~~24~~	~~13~~	~~56~~
~~Reclamation Stockpiles~~	~~4~~	~~11~~	~~13~~	~~28~~
~~Total Project Related Disturbance~~	**~~455~~**	**~~312~~**	**~~217~~**	**~~984~~**

Table 5
LVCM Site Current Surface Disturbance

~~Facility~~	~~Estimated 2020 Disturbance Acreages~~			~~Totals~~
~~Land Ownership~~	~~BLM~~	~~SITLA~~	~~Fee (Private)~~	
~~Centennial Pit~~	~~103~~	~~71~~	~~0~~	~~174~~
~~Sentinel West Pit~~	~~38~~	~~0~~	~~0~~	~~38~~
~~GTO Pit~~	~~0~~	~~33~~	~~2~~	~~35~~
~~Waste Dump C~~	~~157~~	~~0~~	~~0~~	~~157~~
~~Waste Dump B~~	~~0~~	~~137~~	~~0~~	~~137~~
~~Waste Dump A~~	~~89~~	~~40~~	~~0~~	~~129~~
~~Leach Pad~~	~~32~~	~~0~~	~~161~~	~~193~~
~~Process Ponds-PLS, ILS, RAFF, Storm water & Emergency Overflow~~	~~0~~	~~0~~	~~36~~	~~36~~
~~Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Administration~~	~~61~~	~~0~~	~~0~~	~~61~~
~~Haul Roads~~	~~19~~	~~24~~	~~13~~	~~56~~
~~Reclamation Stockpiles~~	~~4~~	~~11~~	~~13~~	~~28~~
~~Total Project Related Disturbance~~	~~503~~	~~316~~	~~225~~	~~1044~~

Facility	timated 2020 Disturbance Acreag			Totals
Land Ownership	BLM	SITLA	Fee (Private)	
Centennial Pit	113	71	0	184
Sentinel West Pit	38	0	0	38
GTO Pit	0	50	10	60
Waste Dump C	157	0	0	157
Waste Dump B	0	137	0	137
Waste Dump A	89	40	0	129
Leach Pad	32	0	180	212
Process Ponds-PLS, ILS, RAFF, Storm water & Emergency Overflow	0	0	36	36
Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Administration	61	0	0	61
Freshwater Ponds & Laydown Areas	0	0	30	30
Haul Roads	19	24	23	66
Reclamation Stockpiles	4	11	13	28
Total Project Related Disturbance	513	333	292	1138

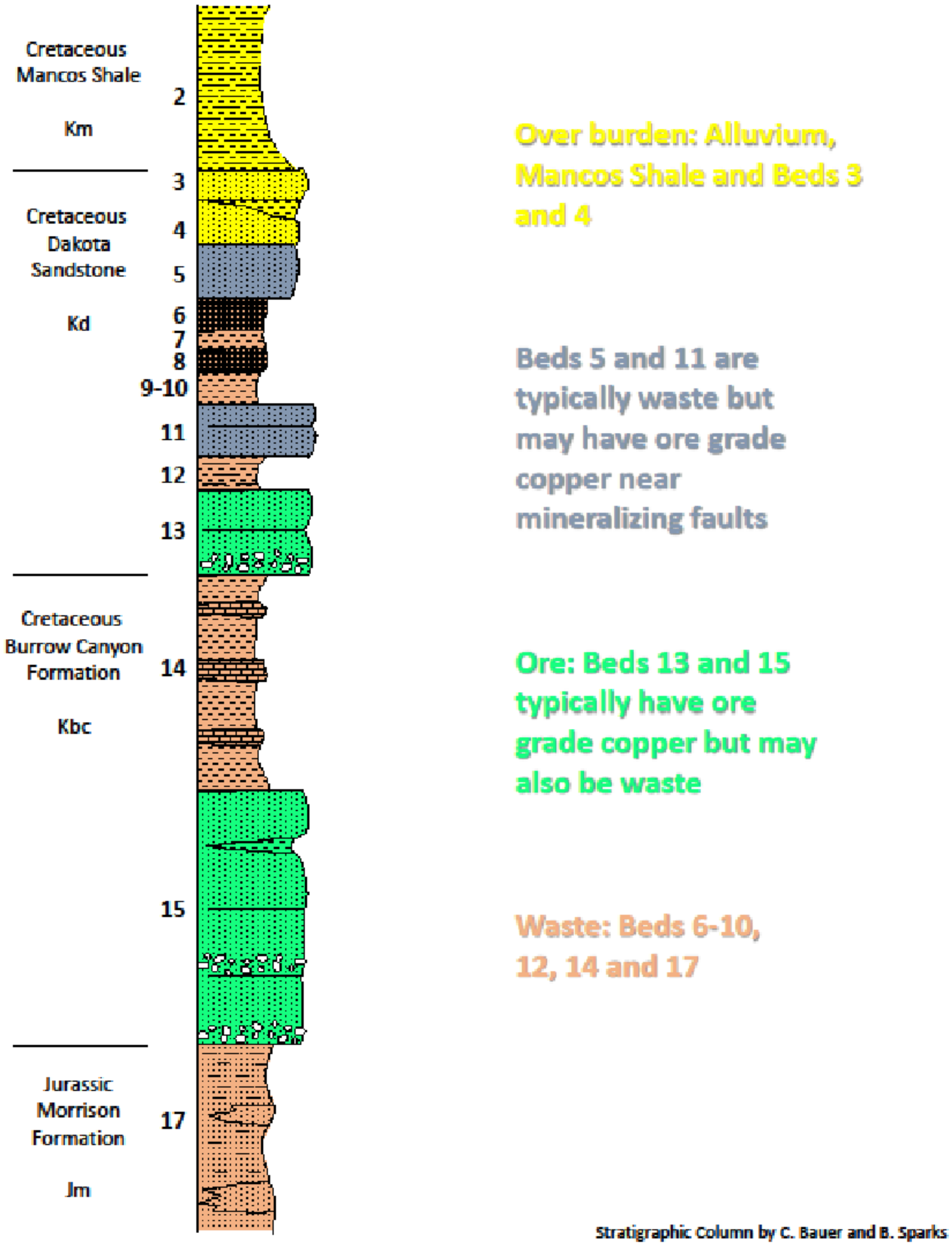
Table 6
LVMC Estimated Site Proposed Surface Disturbance

Included in the disturbance are a number of support facilities such as the SX/EW building, truck shop, admin building, lab, etc. A complete list of all facilities listed on site is seen on Map 2, Appendix C and in Appendix N.

106.4 - Nature of materials mined, waste and estimated tonnages

The Company breaks the stratigraphy of Lisbon Valley into 17 distinct beds for engineering and environmental management. This breakdown is shown in the Strat Column on page 23.

Rock Type 1 is Quaternary Alluvium and is wasted. Rock Type 2 is Mancos Shale and is either stockpiled for final mine reclamation or wasted. Rock Type 3 (Beds 3-5) is upper Dakota Sandstone. This interval can carry some nominal copper grade. Rock Type 4 (Beds 6-8) comprises a carbonaceous facies of the Dakota Formation. It contains little copper and is considered Uncertain; therefore, Rock Type 4 is encapsulated near the center of waste dumps. Rock Type 5 (Beds 9-10) comprises a shaley facies of the Dakota. This material contains too much shale for heap leaching and is considered Uncertain; therefore, Rock Type 5 is encapsulated near the center of waste dumps. Rock Type 6 (Beds 11-13) is comprised of Lower Dakota sandstones and can carry copper grade. Rock Type 7 (Beds 14-15) is comprised of the Burro Canyon Formation. Bed 14 is highly calcic and wasted. Bed 15 is the primary ore host in Lisbon Valley. Geochemical testing for beds 14 and 15 are conducted separately. Rock Type 8 is comprised of variegated shales of the Jurassic Morrison Formation. This material is wasted. The material in the footwall of the Lisbon Valley Fault is mined and wasted. This material is comprised of Jurassic Entrada, Navajo, Kayenta, and Wingate formations. Acid Based Accounting testing results indicate the Jurassic footwall material is Likely Acid Neutralizing.



Strat Column
LVCM Formation, Lithology, and Bed Number

Refer to Figures 1, 2, & 3, Map 3 in Appendix C for additional detail on stratigraphy and geology.

Waste rock is defined as material that contains <0.12% copper, >20% fines, and/or excessive calcium carbonate resulting in > 85lbs/ton acid consumption.

Waste rock includes the overburden and interburden. Overburden includes Quaternary Alluvium and Cretaceous Mancos Shale. Interburden includes barren sandstones and shales within deposits Dakota/Burro Canyon and Jurassic Morrison shales below the deposits.

As per the Waste Rock Management Plan located in Appendix D, waste rock monitoring and testing is conducted on an on-going basis. This testing demonstrates that the bulk of all waste rock (Beds 1-4, 9-17 and Jurassic footwall) are Likely Acid Neutralizing. Table 7 below breaks out bed numbers into rock type categories, provides descriptions and characterizes each according to the tested acid neutralization potential. The table portrays the overall acid neutralizing characteristics of waste rock at LVCM.

The MWMP testing is used as supplementing data to support the ABA data and waste rock characterization determinations. The MWMP results corroborate the ABA results in that rock types 3-5's pH results either become slightly more acidic or become slightly more basic and there is a wider range of metals detected through the MWMP analysis when compared to the other rock types. The other rock types (2, 6, 7 & 8) pH's become significantly more basic and 2 or fewer metals are detected through the MWMP analysis.

Refer to the Waste Rock Management Plan for the current Meteoric Water Mobility and ABA data. As seen in the Waste Rock Management Plan and tables in Appendix D of this document, the purpose of the designation of certain rock types as 'Uncertain' and therefore encapsulated is because of the results of the ABA and MWMP analyses. The mobile metals within rock types 3, 4, and 5 exceed the Utah ground water quality standards and LVCM's background statistics (GWDP 2015) Rock types 1, 2, 6-8, and J did not exceed the background statistics for the LVCM aquifers.

Centennial is the largest deposit, and will be mined in 3 phases. These include Penny, North Centennial, and South Pit. The average strip ratio is approximately 3.6:1 waste to ore. The average yearly mining production is 6MM cubic yards (cu yds). Therefore, the average annual waste rock production is about 4.5MM cu yds of waste rock and 1.5MM cu yds of ore. Pits, Phases, Strip Ratio and Cu Detail, are located in Table 8. Table 9 provides estimated annual tonnages of ore and waste materials to be mined.

Lithology	Bed #	R	Description	Categorization
Quaternary Alluvium	1	1	Unconsolidated sand, silt; and clay.	No Data
Mancos Shale Formation	2	2	Black fissile shale with trace amounts of gypsum. The upper 20-30 feet is usually weathered to a brownish olive-green color.	Likely Acid Neutralizing
Upper Dakota Sandstone	3, 4, 5	3	**Bed 3:** Except in a small area to the north of the Centennial Pit, Bed 3 is a fine to medium-grained buff sandstone, which is sometimes separated from Bed 4 by a black shale lithologically similar to the Mancos Shale. Usually Beds 3, 4, and 5 are identical and inseparable, forming a 45-60-foot-thick well sorted, buff sandstone bed. In all locales Bed 3 is barren of ore. Beds 4 & 5: Fine to medium-grained buff sandstone, sometimes with minor gray shale and carbonaceous material, but usually rather pure. The thickness is usually 35-40 feet. In some areas there is good ore (in excess of 15%) at the base of Bed 5. In outcrop Bed 5 shows a rectangular jointing pattern with a spacing of about 5 feet.	Uncertain
Dakota Sandstone, coaly beds	6, 7, 8	4	**Bed 6:** This bed is usually a coal bed, but may grade to a carbonaceous shale or even to a carbonaceous sandstone. It usually does not have very much copper, but can be quite rich (1% copper) along the contact with Bed 5. Thickness is 5-20 feet, usually about 12 feet. **Bed 7:** Usually a light gray shale, similar lithologically to Bed 9 with a thickness of usually about 10 feet. Rarely, however, it is a fine-grained buff sandstone or a fine-grained gray sandstone. **Bed 8:** Bed 8 is lithologically indistinguishable from Bed 6, except that it is usually a poorer grade coal. It may be either shaly or sandy, but is usually a slightly shaly coal about 6-8 feet thick. Large pyrite balls are not infrequent.	Uncertain
Dakota Sandstone, shaley beds	9, 10	5	**Beds 9 & 10:** Usually indistinguishable. They are usually a light gray shale towards the top, becoming darker towards Bed 11. The contact between 10 and 11 is sometimes gradational but where present, beds 9 and 10 are usually about 35 feet thick.	Uncertain
Lower Dakota Sandstone	11, 12, 13	6	**Bed 11:** Fine to medium-grained sandstone that is either buff or white. Bed 11 is white about half the time and buff half the time. Where buff in color, it frequently has 1-20% black shale. When white, the rock can be indistinguishable from 13. Thickness is 2-35 feet and quite variable. There is frequently ore in Bed 11, especially towards the Lisbon Valley Fault, and the copper tends to be present in the white variety. **Bed 12:** This bed is a faintly green shale to very fine-grained sandstone. This bed can always be identified by its green color. When Beds 11 and 13 hold ore, so does Bed 12, but it will not, in general, produce copper. It is, however, frequently pyritic. Thickness is 5-20 feet, but usually 10 feet.	Likely Acid Neutralizing

Lower Dakota Sandstone	11, 12, 13	6	**Bed 13:** Medium grained white or deep buff sandstone. It can be distinguished from 11 in that it is coarser and more of an orange color when buff, and coarser when white. It almost always has higher copper assays, too. It can be distinguished from Bed 15 in that it is much softer; the rock itself is probably quite loosely cemented, whereas bed 15 grades into a quartzite. Thickness ranges from 20-50 feet and is usually about 30-35 feet.	Likely Acid Neutralizing
Burro Canyon Formation	14	7	**Bed 14:** Usually about 100 feet thick but varies from 70-120 feet. Lithologically, it is composed of red shales, green shales, limestones, massive chert beds, and conglomerates. **Bed 15:** Usually a fine-grained white sandstone frequently medium-grained and occasionally coarse-grained (especially near the base), which is usually very pure (i.e., no feldspars, no magnetite, no chert only well-sorted, well-rounded quartz grains). In thickness, it is usually about 120 feet, although this is variable. Three shale members have been identified: two are green, and one is red. Bed 15 is the most important copper ore-bearing bed in the area. Lithologically, Bed 15 is fine-grained for the first 20 to 30 feet and this zone frequently has copper ore in the 0.4% to 0.9% range. Below 30 feet, Bed 15 becomes medium-grained and usually darker in color (due to chalcocite) and this zone frequently has ore in the 0.8% to 2.0% range and this lasts down to about 45 feet. Below 45 feet Bed 15 becomes fine-grained again, picks up some black chert, and is almost invariably barren of ore.	Likely Acid Neutralizing
	15			
Morrison Formation	17	8	**Bed 17:** The Morrison may be recognized at the base of Bed 15 by: 1) more than 10 feet of red shale; 2) reddish colored sandstones; 3) complete absence of copper; 4) no known green shale in the Morrison in this area. Until now, the Brushy Basin Member has been thought to be a red shale, but more detailed study indicates that there can be a fair amount of sandstone in the Morrison. Sandstone outcrops in the Morrison are indistinguishable from some of the Dakota Sandstone or Burro Canyon Formation beds (usually looks like Bed 15). This means that in places the contact between Bed 15 and the Morrison Formation may be ambiguous.	Likely Acid Neutralizing
Jurassic Footwall	N/A	J	Jurassic strata represent continuing deposition in continental environments. Massive sandstones were deposited in eolian conditions, while interbedded sandstone, shale, and siltstone formed in fluvial conditions. Local freshwater limestones were deposited in lacustrine settings.	Likely Acid Neutralizing

Table 7
LVCM Waste Rock Characteristics

Centennial		Sentinel West (1)		Sentinel East (2)		GTO	
Ore ktons	Waste ktons	Ore ktons	West ktons	Ore ktons	West ktons	Ore ktons	West ktons

17,133.8	54,530.6	6,528.9	3,724.8	1,009.4	1,613.8	586.5	5,456.3

Table 8.a = past mining of LVCM pits, dumps

(1) Sentinal West is considered mined out. This pit will be left open for use as a borrow pit for riprap material during the installation of drainages during concurrent and final reclamation. While the pit remains inactive, however, access will be blocked by berms.
(2) Sentinal East has been mined out and is completely backfilled by the Waste Dump C (Map 1).

Pit Design	Ore Tons	Copper Grade (% Cu total)	Contained Copper, lbs	Waste Tons	Strip Ratio (waste /ore)
Penny South Slough	1,211,157	0.36%	8,726,774	3,153,671	2.6
N Centennial 2.20	1,689,286	0.39%	13,056,362	5,652,071	3.3
N Centennial 3.00	1,973,559	0.33%	12,841,132	7,332,271	3.7
South Pit 3.00	2,020,096	0.39%	15,589,364	13,416,631	6.6
Total Centennial	**6,894,098**	**0.36%**	**50,213,632**	**29,554,644**	**4.3**
GTO Phase 2 3.00	1,278,718	0.65%	16,484,466	10,799,523	8.4
Total	**8,172,816**	**0.41~~40~~%**	**66,698,098**	**40,354,167**	**4.9~~5~~**

Table 8.b
Proposed Future Mining of LVCM Pits, Phases, Strip Ratio and Cu Detail

Estimated Annual Ore and Waste Tonnages						
Phases	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**
Centennial Penny ore ktons	1,211					
Centennial Penny waste ktons	3,154					
Centennial N ore ktons	49	1,432	208			
Centennial N waste ktons	1,976	3,602	74			
GTO Phase 2 ore ktons		27	1,252			
GTO Phase 2 waste ktons		5,150	5,649			
Centennial N ore ktons			10	1,964		
Centennial N waste ktons			3,013	4,320		

Centennial S ore ktons				1	1,533	486
Centennial S waste ktons				3,932	8,687	798

Table 9

Estimated Annual Ore and Waste Tonnages

(anticipated to re-start mining in 2021)

Beds	Year1 tons	Year2 tons	Year3 tons	Year4 tons	Year5 tons
1	0	61,435	61,435	0	0
2	53,584	2,276,913	2,931,217	1,140,729	486,425
(3-5)	91,462	569,879	1,392,010	1,580,161	758,030
(6-8)	93,761	394,964	820,254	627,618	202,328
(9-10)	972,801	282,317	717,055	562,124	127,386
11	281,949	282,317	717,055	562,124	127,386
12	413,864	118,285	396,952	359,251	80,584
13	165,770	184,910	358,217	252,878	79,570
14	80,219	577,320	2,389,108	2,564,126	752,338
15	129,205	263,043	572,968	765,444	455,518
17	129,205	19,237	335,589	542,749	226,397
J	1,182,879	1,151,821	1,185,303	533,661	500,179
Totals	**3,594,699**	**6,182,441**	**11,877,163**	**9,490,865**	**3,796,141**

Table 10

Estimated Annual Tonnages of Annual Waste Material by Bed number

The Class IVb landfill located on Waste Dump A will contain waste materials approved for disposal. The waste materials will be gathered onsite as the waste types are generated. The waste types will be stored separately by type in trash receptacles suitable for each waste type. The receptacles will be hauled to the landfill location monthly, where they will be emptied in 4-6 foot lifts, followed by 24 inches of covering using local waste rock from the Waste Dump A. The waste rock will be placed over the top of the waste materials to stabilize the surface and prevent wind-scattering of the debris. Covering will occur the same day the waste receptacles are emptied. The rock will help hold the waste materials in place and stabilize the surface for the next vertical lift.

The total proposed capacity of the landfill is 57,000 CY. Of that, 75% will be landfilled material, and 25% will be inert rock encapsulation material. The landfill will be used intermittently during ongoing operations, however the bulk of the capacity will be used at the end of mine life during reclamation and disposal of onsite facilities. The landfill will have, at any time during the life of operations, an excess capacity of 20,000 cubic yards that will be used solely for the disposal of onsite facilities during final reclamation. See Appendix N for landfill capacity as it relates to facility demolition and disposal.

106.5 - Existing soil types, location, amount

Topsoil resources (growth media) were evaluated and inventoried during baseline data gathering activities in 1994 and during operations from 2006 to the present, see Baseline Soils Report in Appendix

L. Growth media stockpiles are strategically and opportunistically located throughout the project area for final reclamation. Salvage of the A & B horizons of soil will provide 1,887,394 cubic yards of growth media, which will provide approximately 12" of cover material over the facilities during final reclamation activities (not including pits which are authorized to stay open). Salvageable growth media is stockpiled away from active mining areas, revegetated, and sloped to minimize erosion. Growth media will be stockpiled in the pits, wherever possible, to minimize additional surface disturbance. Growth media stockpiles will constitute up to 68 acres of impact throughout the project area.

In 2012 the Company contracted with Mindy Wheeler of WP Resources to review activities and success of reclamation activities and propose ongoing reclamation guidelines. LVCM's waste rock rapidly breaks down to a sandy soil. Laboratory analysis concluded that the waste rock soil is a comparable growth media to the native soils. They both required similar amendments to promote optimal native plant growth conditions and they have similar exchangeable sodium characteristics. The report concluded that LVCM's waste rock can be considered a comparable growth media and would be successful at revegetation with proper management. The Reclamation Guidelines with the laboratory results is attached as Appendix G. Refer to Map 5 located in Appendix C.

106.6 - Plan for protecting & re-depositing soils

The Company's plan to protect existing soils is first to remove soils before mining activities start. The second step is to stockpile the soils in an area that will not be disturbed, in a way/shape that reduces erosion, and apply BLM & DOGM approved seed mix to the surface (see section 110.5.4 for seed mix details). These efforts should reduce erosion and weed growth.

As of January 2015, LVCM had stockpiled the growth media required to reclaim 2015 surface disturbance at the site (waste dumps & leach pad). Table 11 details the growth media requirements and stockpiles. Refer to Map 5 located in Appendix C. As of 2020, the total accessible stockpiled growth media has not changed from what was reported in 2015. Additional topsoil will be salvaged to a depth ranging from 1' to 10' depending upon the suitability of the alluvium for use as growth media. Additional topsoil will be salvaged as disturbance related to ongoing operations continues. If additional volume of topsoil is necessary, a borrow area southeast of the GTO pit could be a possible source of topsoil. Estimated volumes of additional toposil to be borrowed is in excess of 160,000 CY,. Reclamation of the borrow pit would include grading and re-seeding. Another location of additional topsoil would be a borrow pit located directly west of the leach pad. This area has not been tested for soil depth, however further investigations will be performed if deemed necessary to ensure adequate topsoil is available for final reclamation.

LVCM Growth Media Requirements				
Area	**Acres**	**Sq ft**	**Cu ft soil**	**Cu yd**
Leach Pad	212	9234720	9234720	342027
Process Ponds	36	1568160	1568160	58080
Process Area	61	2657160	2657160	98413
C Dump	63	2744280	2744280	101640
B Dump	132	5749920	5749920	212960
Clay pile	7	304920	304920	11293
A-Dump	129	5619240	5619240	208120
Haul roads	66	2874960	2874960	106480
Open Pit Haul roads	14	609840	609840	22587
GTO-Dump	7	304920	304920	11293
Centennial Pit Backfilled Surface	25	1089000	1089000	40333
Totals	**752**	**32,757,120**	**32,757,120**	**1,213,227**
2015 Surveyed Soil			29,280,879	1,084,477
Additional Soil Collection Necessary			3,476,241	128,750
TOTAL SOIL FOR RECLAMATION			**32,757,120**	**1,213,227**

~~LVCM Growth Media Requirements~~				
~~**Area**~~	~~**Acres**~~	~~**Sq ft**~~	~~**Cu ft soil**~~	~~**Cu yd**~~
~~**Leach Pad stages 1-3**~~	~~192~~	~~8,355,156~~	~~8,355,156~~	~~309,450~~
~~**Process Ponds**~~	~~36~~	~~1,568,160~~	~~1,568,160~~	~~58,080~~
~~**Process Area**~~	~~10~~	~~435,600~~	~~435,600~~	~~16,133~~
~~**C-Dump west**~~	~~65~~	~~2,828,569~~	~~2,828,569~~	~~104,762~~
~~**C-Dump east**~~	~~27~~	~~1,163,615~~	~~1,163,615~~	~~43,097~~
~~**ET Cap Sent east**~~	~~23~~	~~1,015,119~~	~~1,015,119~~	~~37,597~~
~~**B-Dump**~~	~~132~~	~~5,744,170~~	~~5,744,170~~	~~212,747~~
~~**Clay pile**~~	~~7~~	~~288,611~~	~~288,611~~	~~10,689~~
~~**A-Dump**~~	~~129~~	~~5,619,240~~	~~5,619,240~~	~~208,120~~
~~**Leach Pad stage 4**~~	~~74~~	~~3,223,440~~	~~3,223,440~~	~~119,387~~
~~**Haul roads**~~	~~56~~	~~2,439,360~~	~~2,439,360~~	~~90,347~~
~~**Open Pit Haul roads**~~	~~14~~	~~624,038~~	~~624,038~~	~~23,113~~
~~**GTO-Dump**~~	~~7~~	~~304,920~~	~~304,920~~	~~11,293~~
~~**Centennial Pit Backfilled Surface**~~	~~8~~	~~348,480~~	~~348,480~~	~~12,906~~
~~**Totals**~~	~~**780**~~	~~**33,958,487**~~	~~**33,958,478**~~	~~**1,257,720**~~
~~**2015 Surveyed Soil**~~			~~29,280,879~~	~~1,084,477~~
~~**2016 to 2020 Soil Collection**~~			~~21,678,759~~	~~802,917~~
~~**2020 Total Stockpile**~~			~~**50,959,638**~~	~~**1,887,394**~~
~~**2020 Soil Requirement**~~			~~33,914,918~~	~~1,256,107~~

~~Surplus~~			~~17,001,160~~	~~629,673~~

Table 11
LVCM Growth Media Requirements

Location of existing topsoil stockpiles and their volumes, as well as the proposed borrow pits, can be found on Map 5, Appendix C.

106.7 - Existing vegetation - species and amount

Lisbon Valley is relatively typical of this region of the Colorado Plateau in that the valleys are covered in sagebrush and the hillsides are dominated by pinyon-juniper woodlands. The vegetation inventory is detailed in the FEIS February 1997 and the baseline flora and fauna data was detailed in a 1994 report by Woodward-Clyde attached as Appendix F. WP Resources 2012 Reclamation Guidelines report addressed vegetative communities and cover levels attached as Appendix G. Color photographs were taken for Section 105.4 in September of 2016, and are included in Appendix B showing the current vegetative communities and cover levels around the mine site.

There is no riparian habitat within the project boundary.

Updated vegetation and wildlife information is actively being compiled for the active mine plan boundary. The Company commits to ensuring updated vegetation and wildlife information is made available to the Division annually, or on a frequency deemed acceptable by the Division.

106.8 - Depth to groundwater, extent of overburden, geology

The geologic setting of the project is consistent with Southeastern Utah. Lisbon Valley is located near the center of the Paradox Basin, an asymmetric sedimentary basin of Pennsylvanian to Cretaceous age. The structure and stratigraphy of the basin are dominated by the thick evaporite deposits of the Pennsylvanian Paradox Formation (Paradox). During the Pennsylvanian, the Paradox subsided along a series of northwest trending faults forming a restricted seaway bounded on the northeast by the Uncompaghre Uplift and on the west by the Kaibab Uplift and the Emery High. The seaway accumulated locally thick deposits of evaporates including salt. Plastic deformation of the salt caused by the weight of the overlying sediments caused the salt to flow along pre-existing basement structures where accumulations were thickest. The salt flow formed a series of elongate northwest trending diapirs following the dominant structural fabric of the basin. Anticline structures developed over the diapirs between Middle Pennsylvanian and Late Triassic time. The structures were further deformed during Jurassic, Late Cretaceous, and Early Tertiary by folding, faulting and renewed salt movement.

The initial, most active, period of salt structure growth started in the Late Pennsylvanian to Permian and continued for about 75 MM years until the Middle to Late Triassic. This salt uplift influenced sedimentation of the Permian to Triassic rocks. Sediments were deposited as thin layers, or not at all, over the rising salt diapirs, and as thick layers in adjacent subsiding areas. Near the margins of the salt diapirs, the sedimentary rocks are commonly brecciated, upturned, and display numerous local unconformities. The unconformities developed as the sediments were tilted as the salt rose planed off by erosion and then covered by younger sediment. Each unconformity registers a time when subsurface faults were active and the salt moved. After a tectonic pause in the Early Jurassic some of the salt diapirs grew again in the Middle Jurassic. Later Jurassic to Cretaceous sediments were deposited above the salt anticlines with little thickness variations. During the Late Cretaceous to Early Tertiary Laramide orogeny, a series of gentle anticlines and synclines were formed. Many of these young anticlines, including Lisbon Valley, were developed as upward extensions of pre-existing salt anticlines. The younger set of anticlines is sub-parallel to the older structures, but not necessarily coincident. Diapiric salt movement was rejuvenated at this time and continues to the present. The surface of some of the breached anticlines is a residual rubble of gypsum and siltstone developed from Paradox Formation from which the salt has been leached. Present examples include the Moab, Paradox, and Sinbad anticlines.

In Lisbon Valley, the anticline structure is unbreached and the evaporite sequence remains covered by folded and faulted younger rocks reflecting the anticlinal structure created by the still-rising salt. The Lisbon Valley anticline structure is about 15 miles long and is faulted along its longitudinal axis by the Lisbon Valley Fault. The fault strikes N40°W and dips 50°-85° northeast. Its vertical displacement exceeds 3,800' and juxtaposes Cretaceous formations against Permian. At the ends of the Lisbon Valley Fault the structure tends to horsetail into a number of smaller branching fault strands.

Sedimentary stratigraphy within copper deposits includes Quaternary Alluvium, Mancos Shale, Dakota Sandstone, Burrow Canyon Formation and The Brushy Basin Member of the Morrison Formation, with Lower Jurassic and Permian formations in the footwall of the Lisbon Valley Fault. LVMC breaks the stratigraphy within the deposits into 17 distinct beds for engineering, production and environmental management. Quaternary alluvium is identified as Bed 1 and is comprised of light brown to red sand, silt and gravel, and stream and flood deposited alluvium. The Cretaceous Mancos Shale is identified as Bed 2. The Mancos shale is a black, dark gray to brownish olive-green, thinly laminated to thin bedded marine shale with occasional limy fossil beds. The Cretaceous Dakota Sandstone has is identified as Beds 3-13. Bed 3 is a buff to white, fine to medium grained sandstone. Bed 4 is a buff to gray, medium grained sandstone to silty sandstone with minor interbedded gray shale. Bed 5 is a buff colored fine to medium grained sandstone. Bed 6 is a coal bed of variable thickness usually averaging 12' and can grade into carbonaceous shale. Bed 7 is a light to dark gray silty shale. Bed 8 is a poor grade coal bed, usually silty or shaly and typically contains pyrite. Beds 9-10 are usually indistinguishable light to dark gray silty or shaly, fine to medium grained sandstone. Bed 11 is a white to buff colored fine to medium grained sandstone and can contain up to 20% black shale or organics. Bed 12 is a pale green to gray shale. Bed 13 is a white to buff colored medium grained, poorly cemented sandstone and matrix supported chert pebble conglomerate, with minor pale green to gray shale beds and lenses. The Cretaceous Burro Canyon Formation is identified as beds 14-16. Bed 14 is a red to light gray variegated siltstone and shale. Bed 14 can grade into buff or gray limestone and sometimes contains massive chert beds. Bed 15 is a buff to gray to white, fine to medium grained and rarely coarse-grained sandstone and matrix supported chert pebble conglomerate. Bed 15 can contain pale green to gray shale beds and lenses. Bed 16 is similar to Bed 15 but with poor cementation and is usually indistinguishable from Bed 15. The Jurassic Brushy Basin Member of the Morrison Formation is identified as Bed 17. Bed 17 is a maroon to red to brown variegated siltstone, mudstone and calcareous sandstone.

Copper deposits in the Lisbon Valley occur near faults in collapsed blocks of Dakota and Burro Canyon Formations over a former anticline structure. The Lisbon Valley Fault is the most prominent fault and runs parallel to a series of en-echelon faults that extend across the width of Lisbon Valley and strike parallel to the NW/SE anticlinal axis.

Lisbon Valley mineralization is characterized by low-temperature, finely disseminated copper minerals in permeable sandstones of the Cretaceous Dakota and Burro Canyon Formations. Warm, chlorine-rich brines released from the Paradox Formation moved upward through the Lisbon Valley Fault system and stripped loosely bound copper from the red-bed Cutler and Chinle Formations. When the upward-moving mineralizing fluids encountered the impermeable Mancos shale, they spread laterally into the permeable intervals of Dakota and Burro Canyon sandstones. It is here that the fluids prepared the host rock and subsequently precipitated copper under acceptable redox conditions.

The Centennial deposit lies immediately northeast, and adjacent to the Lisbon Valley Fault. Mineralization is concentrated in the lower Burro Canyon formation but also occurs in all sandstone beds in the Dakota Sandstone. Two anticline collapse faults tilt bedding to the southwest (see Appendix C, Figure 1: Geologic Cross Section of the Centennial Deposit). The Centennial Deposit is approximately 4,000’ long and 1,500’ wide.

The GTO deposit lies immediately northeast and adjacent to an offset splay of the Lisbon Valley fault. In the GTO deposit, mineralization is concentrated in the lower Dakota Sandstone with mineralization in the Burro Canyon Formation as well. An anticline collapse fault tilts bedding to the east, away from the Lisbon Valley splay fault (see Appendix C, Figure 2: Geologic Cross Section of the GTO Deposit). The GTO deposit is approximately 2,800’ long and 750’ wide.

The Sentinel deposit is situated on the east side of Lisbon Valley along an antithetic, valley-bounding fault. The deposit is comprised predominantly of oxide ores near the surface and chalcocite ore at depth in the Burro Canyon Formation. The Burro Canyon lies exposed on the east side of the valley and where the Dakota is largely eroded away, leaving Burro Canyon as the remaining host. The deposit plunges steeply into a graben structure on its SW side (see Appendix C, Figure 3: Geologic Cross Section of the Sentinel Deposit.). The Sentinel deposit is approximately 1500’ long and 800’ wide.

Groundwater occurs beneath the project site as vertically and laterally discontinuous aquifers and is structurally controlled. Four water-bearing units comprise the groundwater system. These include valley fill, Mancos Shale perched units, the Burro Canyon (BC) Aquifer, and Navajo (N) Aquifer. Groundwater ranges from 60’ below ground surface (bgs) in the valley fill and Mancos Shale, to 300’ bgs in the BC Aquifer and 800’ bgs to 1000’ bgs in the N Aquifer. Groundwater information is detailed in Sections 3.2.3 and 4.2 of the February 1997 FEIS. Additionally, LVMC monitors groundwater and heap leach facilities in accordance with Utah Groundwater Discharge Permit UGW 370005 included in Appendix H. LVMC reports quarterly groundwater sampling results to the BLM and DOGM.

Detailed information regarding Centennial Pit backfilling should reference: Arcadis’s Updated Centennial Pit Backfill Evaluation March 2014, Whetstone’s Method and Results for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock March 2014, Whetstone’s Method and Results for 2015 Geochemical Testing of Lisbon Valley Mine Waste Rock January 2016, BLM’s Decision Record Environmental Assessment DOI-BLM-UT-Y010_2014-0018EA, and BLM’s Determination of NEPA Adequacy DOI-BLM-UT-Y010-2016-0158-DNA.

Pit dewatering is required for all three of LVMC’s open pits. The Centennial Pit will be dewatered until mining activities are completed below 6190’ AMSL. The GTO Pit is dewatered by LVMC’s Production Well 12 (PW-12). LVMC utilizes PW-12’s water for copper production needs. LVMC maintains water rights for process water. Water Rights #’s 05-2593 (F69971). The Sentinel Pit will be dewatered until mining activities are completed below 6250’ AMSL.

Overburden material is comprised of soil, alluvium, and Cretaceous Mancos Shale. Rock Characterization is discussed in detail in sections 106.2, 106.4 and the Waste Rock Management Plan had additional detailed information attached as Appendix D.

106.9 - Location & size of ore, waste, tailings, ponds

Ore is stored and processed on the Leach pad. The leach pad is designed to stockpile 33MM tons of ore. A discussion of the heap leach pad, its features and function, are in section 106.2. Refer to Maps 2 in Appendix C. At the end of the mine life the ore on the heap leach pad will become spent ore and should be considered similar to tailings. Details regarding the reclamation of the heap leach pad are covered in the reclamation plan section 110. The current waste dump design includes three waste dumps, only one of which is active. The dump to the north of the Centennial Pit (Waste Dump C) is considered complete and has undergone reclamation and revegetation efforts, although complete reclamation is anticipated to be completed in 2020-2021. The dump west of the GTO pit (Waste Dump A) is designed to receive 31MM tons and cover 129 acres. This is the only active dump within the LVCM. The dump to the north of the GTO Pit (Waste Dump B) is considered complete and will undergo reclamation and revegetation in 2020-2021. All dumps are designed with a maximum 2.5H:1V slope. A small section of Waste Dump C's west-facing slope was constructed with angle-of-repose slopes. However, this slope appears to be stable and pushing the slope down to 2.5H:1V will occur during 2021.

The Centennial Pit will be backfilled with waste Beds 2 through 17 as mining is conducted. Backfilling of the Centennial Pit was approved after a comprehensive NEPA evaluation, see *Centennial Pit Partial Backfilling Revision 3*, submitted March 2015, and the later-approved 2016 Plan for Centennial Backfill Expansion. The specific objective was to assess the potential impacts to groundwater refilling into Centennial Pit and coming in contact with this material after mining is complete. Arcadis's Updated Centennial Pit Backfill Evaluation March 2014 report calculated averaged beds 14 & 15 NNP of 187.2 tons $CaCO_3$/kt calculated from the 1997 FEIS, operational cauterization (2005 through 2013) and the 2014 column testing program. This NNP value differs from the Waste Rock Management Plan NNP value as the Waste Rock Management Plan is updated annually and is calculated from operational (2005 through current) data. The Centennial Pit Backfilling Evaluation March 2014 was based on extensive testing, including the following.

- Acid-base accounting (ABA)
- Static water leach testing using single and multiple extraction modified meteoric water mobility procedure (MWMP) and Synthetic Precipitation Leaching Procedure (SPLP) testing.
- Kinetic column testing following the procedures specified in the Final Work Plan for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock.[7]
- Solid phase elemental analysis by inductively coupled plasma atomic emission spectroscopy and mass spectrometry (ICP-AES and ICP-MS);
- Mineralogy by transmitted light thin-section microscopy and Rietveld x-ray diffraction (XRD).

Further, the testing indicates that backfilling these waste beds will meet Utah Groundwater Quality Standards or improve background levels as regulated by the Utah Division of Environmental Quality

[7] Whetstone 2014. Workplan for Additional Geochemical Testing of Waste Rock Jan 2014

(UDEQ). Written authorization for backfilling in the context of this testing is provided by BLM[8], UDEQ,[9] and DOGM[10].

Backfill Plan

The backfilling plan calls for backfilling of the Centennial Pit to a minimum elevation of 6,200' or until all backfilling opportunities are exhausted (Page 1, paragraph 4; BLM 2015 Decision Record EA). As the initial purpose was to protect the Burro Canyon from undue and unnecessary degradation, the elevation of 6,200' was chosen, as it is 10' above the pre-mining water level of the BC aquifer. The Centennial pit will be backfilled using a mixture of Beds 2 through 17. Beds 2, 11, 12, 13, 14, 15 and 17 will be backfilled below the 6200' elevation and the mixture will be a minimum 75% to 100% Bed 2, 12, 14, 17 and 0% to 25% beds 11, 13, 15. Mixed waste from Beds 2 through 17 will be backfilled above 6200'. The current mine plan is phased in such a way that there will never be a void space larger than 275,000 cubic yards below the 6,200' of the Centennial Pit. The reason for this is due to the last phase of mining having a final floor level above 6,200', and all waste encountered during the pushback to receive the last phase of ore will be deposited in the existing mined-out portion of the pit floor.

Backfill Quality Assurance

The Company analyzes all the blast holes, surveys and demarks ore/waste boundaries, and creates detailed geologic maps of all pits as part of its grade control process.[11] This process provides the quality assurance (QA) necessary to discretely identify ore, waste, Bed number, and Rock Type. The same process will be used to identify waste for backfilling. The backfill is not anticipated to settle more than 2' based on analogous waste dump surveys and heap leach surveys conducted by LVMC.

Water Storage/Treatment Ponds

The Company stores groundwater in one 240,000 gallon above ground storage tank (AST) and three retention ponds with total storage capacity of 19M gallons. The locations are shown in Maps 2 Surface Facilities Map 1 & 2.

The solution ponds are designed to separately store four solutions, including PLS (pregnant leachate solution), 2007 ILS (intermediate leachate solution), Raffinate (barren solution), and storm water. Solution ponds are covered under the updated GWDPA. Refer to Map 1, Map 2, Map 4, the Company's SWPPP, Map 5 and Figures 8, 9 & 10 located in Appendix C. Table 12 shows solution capacity per pond.

Pond Name	Cubic Feet	Gallons	Acre-feet
PLS Pond	1,288,238	9,636,691	29.57
ILS Pond (below weir/outlet)	997,012	7,458,170	22.89
Raff Pond	969,585	7,253,002	22.26
Stormwater Pond	743,036	5,558,295	17.06
Emergency 10-yr 24-hr overflow Pond ("100-yr Pond"*)	1,840,311	13,766,480	42.25

[8] BLM 2015. Finding of No Significant Impact EA----
[9] UDEQ 2015. Groundwater Discharge Permit ------
[10] Utah Division of Oil, Gas & Mining 2015. Review of Amended Notice of Intent to Commence Large Mining Operations and Updated Centennial Pit Backfill Proposal, Lisbon Valley Mining Company LLC, Lisbon Valley Mine, M/037/0088, San Juan County, UT.
[11] LVMC 2008 Ore Grade Control Quality Assurance Plan. Aug 2008

TOTAL PROCESS STORAGE	**5,838,182**	**43,672,638**	**134**
Haul Road Retention Pond	791,919	5,923,966	18.18
GTO Pond 1	871,198	6,517,014	20
GTO Pond 2	871,198	6,517,014	20
TOTAL FRESH WATER STORAGE	**2,534,315**	**18,957,995**	**58**

Table 12
Pond Capacities

Ephemeral Stream Channels

Ephemeral stream channels will be permanently diverted around open pits as stipulated in the 1997 BLM Record of Decision. Impacts to groundwater, surface water and wildlife have been reviewed and documented in the 1997 EIS.

106.10 - Amounts of Material extracted or moved

The types of material to be extracted and/or moved within the LVCM include:

Copper-bearing ore (Tables 8.a, 8.b, 9)

Barren waste rock (Tables 8.a, 8.b, 10)

Topsoil (Table 11)

Tables 8.a, 8.b, 9, and 10 outline the amounts and types of material extracted or moved. Table 11 details the total amounts of topsoil that has been or will be stockpiled and/or readily available for use during final reclamation.

R647-4-108 - Hole Plugging Requirements

The Company will properly plug drill holes as soon as practical and shall not leave them unplugged for more than 30 days without approval of the Division.

The Company's surface plugging of drill holes shall be accomplished by setting a nonmetallic perma-plug at a minimum of 5'below the surface, or returning the cuttings to the hole and tamping the returned cuttings to within 5' of ground level. The hole above the perma-plug or tamped cuttings will be filled with a cement plug. If, the cemented casing is to be left in place a concrete surface plug is not required, provided that a permanent cap is secured on top of the casing.

Drill holes that encounter water, oil, gas or other potential migratory substances and are $2^1/_2$" or greater in surface diameter shall be plugged in the subsurface to prevent the migration of fluid from one stratum to another. If water is encountered plugging shall be accomplished as outlined below.

Holes that encounter significant amounts of non-artesian water shall be plugged by placing a 50'cement plug immediately above and below the aquifer(s) or filling from the bottom up (through the drill stem) with a high-grade bentonite/water slurry mixture. The slurry shall have a Marsh funnel viscosity of at least 50 seconds per quart before the adding of any cuttings.

The Centennial Pit Backfill proposal included a monitoring well near the pit for regular water quality testing. The Company has identified the existing well SLV3 as the ground water monitoring point. The

Centennial pit may expand to the south and consume SLV3. At this point, the Company will identify another suitable replacement ground water monitoring point. SLV3's UTM NAD83 Zone 12 coordinates are 4,223,407N 664,080E.

R647-4-109 - Impact Assessment

109.1 - Impacts to surface & groundwater systems

The Company maintains a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Utah Pollutant Discharge Elimination System (UPDES) Permit UTR 000737 and UPDES General Multi-Sector General Permit (MSGP). The MSGP authorizes storm water discharges related to Industrial Activities, Group 3, Sector G (Metal Mining). The LVCM is considered an "Active Metal Mining Facility" (AMA) under the MSGP, and subject to Pollution Prevention Plan Requirements. The SWPPP and the Utah Pollutant Discharge Elimination System permit is attached as Appendix M.

The SWPPP describes pollution prevention and control practices designed to minimize the contact of storm water with "significant materials", and thereby avoiding impacts, or otherwise manage water after such contact, so there is no discharge.[12]

The SWPPP authorizes the diversion of surface water around the active mining area (AMA). Activities in the AMA the following:

- Road Construction
- Drilling and blasting
- Open-pit excavation
- Ore and waste rock hauling and stockpiling
- Heap Leaching
- Solvent Extraction-Electro Winning (SX-EW)
- Vehicle maintenance and parking

The Company avoids impacts to surface water systems through implementation of best management practices (BMP) in accordance with the SWPPP. BMP are developed to minimize the potential for non-point source pollution to surface waters.

BMPs include both structural and non-structural controls. Structural controls include:

- Diversion
- Retention
- Erosion and Sediment Control
- Stabilization
- Energy Dissipation

Structural control methods are implemented to site conditions, and modified as site conditions change with on-going mine development. These include:

- Diverting runoff away from roads and other denuded areas by using berms, ditches, and other functionally equivalent diversions.
- Preparation of road drainages and outlets by removing fugitive outfalls and consolidating runoff into designed outfall structures that are capable of managing the expected runoff volume.

[12] EPA defines "Significant materials" to include, but are not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

- Reducing runoff velocities by using energy dissipation devices and minimizing grade. Refer to Map 4 located in Appendix C.
- Trapping sediment on-site in sediment ponds, sumps, and other functionally equivalent structural controls.
- Capturing runoff, when practical, to eliminate the potential for storm water discharges.

Diversion channels and retention ponds comprise the primary structural controls at LVCM. The Company maintains three primary manmade retention ponds, and one primary natural catchment basin. Refer to Map 2 ~~4~~ located in Appendix C. The upper retention pond is located southeast of the leach pad and functions to retain a large portion of surface water runoff from the highest flowing sub basins located on the rim rock south of the leach pad. The lower retention ponds are located east of the GTO Pit and situated on low-permeability Mancos shale. The primary natural catchment is located south of the Sentinal west pit and occurs in low-permeability Mancos shale. This catchment is a natural drainage area that has been isolated from all surrounding surface water drainage systems by the Sentinal west Pit and related activities. The primary catchment can retain a significant amount of runoff, as the only overflow path of the primary drainage is into the Sentinal west Pit. This primary catchment is located downstream of the entire mine boundary, with a direct culvert system immediately adjacent to the 100-year storm pond. The significance of this catchment is that it has storage capacity to withhold any discharge quantity that may occur as a result of catastrophic Force Majeure situations. Many of the existing and operational storm water control features will be left in place and expanded upon for post-reclamation hydrologic controls. Such features that will be expanded include drainage diversion channels and catchments. The post-mining control features will also include the permanent diversion of runoff from Dump C and north of the mine area to re-connect with the existing ephemeral Little Valley drainage. Refer to Map 4 located in Appendix C.

Non-structural controls include maintenance, spill prevention & response, inspections, training, and record keeping. These controls are detailed in the SWPPP. Culverts are located around the project area in order to ensure storm water is diverted to the designated receiving areas.

Surface Water and Groundwater Protection

Groundwater occurs in four low-yield, poor-quality aquifers below the site. These include valley fill, Mancos, Burro Canyon (BC) and Navajo (N) aquifers. The valley-fill aquifer exceeds state primary drinking water standards for gross alpha and gross beta levels. Secondary standards are exceeded for dissolved manganese and TDS. The Mancos aquifer exceeds primary standards for sulfate, TDS, gross alpha, and gross beta. The BC and N aquifers exceed primary and secondary standards for gross alpha, gross beta, sulfate, TDS, antimony, dissolved zinc, and dissolved manganese.

The Company monitors groundwater and facilities in accordance with Ground Water Quality Discharge Permit (GWDP) UGW370005 in compliance with the provisions of the Utah Water Pollution Control Act. The GWDP is in the process of being updated to reflect the re-start of operations. The GWDPA, as written, assumes all ground water monitoring controls as already approved in the existing GWDP. The existing GWDP describes how potential impacts to groundwater are minimized by the design and construction of process facilities that under normal operating conditions will not discharge.

In December 2018, Whetstone Associates provided the Company with a 20-year summary report of the water quality monitoring data that had been collected by Whetstone from water wells throughout the Project Area from a period ranging from 1998 through to 2018. As part of the summary report, Whetstone performed an evaluation of the ground water flow direction and the communications (or lack thereof) between the aquifers that exist within the Project Area.

According to the report, there is a large unsaturated zone that exists between the BC and N aquifers. Moreover, both the BC and N aquifers are highly segmented, with faults generally acting as barriers to flow across faults. Of note, active mining has been performed within the Lisbon Valley Active Mine Area, with open pits being deepened yearly. Over the twenty-year monitoring event, there has been no indication of communication between the BC and N aquifers, as would have resulted in change in water quality and overall water chemistry of the distinct aquifers.

Moreover, there is no indication of dewatering of the N aquifer which was a question posed in the 1997 ROD as it relates to the Dolores River system. Therefore, the Company maintains high confidence that the empirical results of the 20-year monitoring support that no impacts to surface or ground water has or will occur as mining continues.

The results of the 20-year monitoring are available as annual submissions to the DWQ in accordance with the Company's GWDP.¶

The GDWP provides background water quality, groundwater protection levels, Best Available Technology (BAT), and monitoring requirements. Implementation and maintenance of BAT protects groundwater and surface water from potential contaminant sources, including solution ponds, leach pad, SX/EW plant, waste dumps, and processing facilities. These facilities are constructed with clay composite/synthetic liners, maintained, and monitored in accordance with the BAT standards. Above ground storage tanks (AST) and other reagent storage are contained with synthetic liners or otherwise contained in concrete. BAT monitoring includes:

a. Leak Detection under Leach Pad and Ponds
b. Pad Settlement
c. Solution Water Balance to Maintain Storm Water Capacity in Ponds
d. Heap Slope Stability
e. Diversion Ditch Erosion
f. Waste Rock Chemistry (Acid/Base)
g. Sediment in Retention Ponds and Diversions
h. Spill Containment

A copy of the GWDP included in Appendix H and BAT Monitoring Plan is included in Appendix K. The updated GWDPA is also included in Appendix H.

As stated above, the facilities, including the process ponds, are constructed with underlying clay layers, and are also constructed within an area underlain by limestone and mancos shale. The combination of the manmade installed controls and geologic controls further enhance the protection of water resources. To date, there have been no indication through the continued ground water monitoring of impacts to ground water quality as a result of the ongoing operations.

Pit pools are simulated to accumulate in the GTO and Sentinel west pit~~Pits~~ at or near the pre-mining groundwater elevation. This data will not change as seen in the updated GWDPA. The Centennial Pit is approved to backfill above the pre-mining groundwater level, therefore, there is no pit pool expected.

~~Pit pools in the GTO and Sentinel west pitPits are authorized by the existing GWDP and anticipated to concentrate some chemical constituents, metals, and TDS. Chemical constituents include: sulfate,~~

~~chloride, sodium, and calcium. Metals include: aluminum, arsenic, selenium, molybdenum, manganese, iron, uranium, and zinc.~~

~~During the permitting process and as part of the 1997 Environmental Impact Statement process the potential for the development of pit lakes for the Centennial, Sentinel and GTO pits were studied. The existing GWDP describes the two hydrogeologic models used to predict potential post mining pit lake scenarios. The first model was based on the classical hydrologic flow in the horizontal direction and the second model was based on a vertical flow model. Field testing suggests that the vertical model most appropriately represents groundwater flow (drilling and testing of paired shallow and deep monitoring wells MW96-7A and MW96-7B [Adrian Brown Consultants 1996b]) and a vertical spreadsheet model was developed for each of the proposed pits. The vertical model was a numerical implementation of the following concept:~~

> ~~In this system, flow is predominantly vertical. Infiltration moves to the upper saturated zones, where it is essentially perched. Most of the infiltration seeps vertically to the underlying materials, which ultimately drain to the deep basin sediments, which in turn drain to the [Delores] river. Little groundwater flow takes place laterally in the shallow saturated zone [Burro Canyon aquifer], due to its segmentation (Adrian Brown Consultants, 1996c).~~

~~This detail regarding pit pools references the Whetstone Associates 2008 Annual Update of the Lisbon Valley Hydrogeologic System Evaluation. The report provides a detailed summary of the previous numerical ground water modeling and predicted pit pools and water quality.~~

~~A separate Centennial Pit Backfilling pit pool model and water quality predictions were developed in support of the backfill permitting process in 2014. The Sentinel and GTO pits were not included in this model.~~

~~Anticipated impacts to water quality due to the Centennial Pit backfilling are discussed in Section 106.9; the Company has simulated and evaluated potential effects on post-mine groundwater quality resulting from backfilling the Centennial Pit. The discussion of model parameters references the Lisbon Valley Mine Updated Centennial Pit Backfill Evaluation (Arcadis March 2014).~~

~~A three-dimensional groundwater flow model was developed based on the information included in the 2009 Annual Update of the Lisbon Valley Hydrogeologic System Evaluation (Whetstone 2010), updated pit geometry, and the pit backfilled to 6200' ft amsl. The model was developed to address; potential for a pit lake development, estimate the rate of recovery of pit lake levels (if a pit lake develops), evaluate groundwater inflows into the pit lake overtime, and evaluate the potential of groundwater seepage through the floor of the pit in the underlying Morrison Formation.~~

~~The model was constructed using the following assumptions; 3 layers, layer 1, the Burro Canyon Aquifer with a thickness of 172 ft, layer 2, Morrison Formation with a thickness of 390 ft, and layer 3, the N-Aquifer with an arbitrary thickness to allow a constant head to be applied to represent the discharge to the N-Aquifer.~~

~~Hydrogeologic properties were applied to each layer based on field measured values of hydraulic conductivity and literature values of storage. The model parameters were slightly adjusted to meet a pre-mining steady state water level scenario.~~

~~The lack of lateral flow observed in the Burro Canyon aquifer and Morrison Formation allows the recharge to be calculated based on the vertical gradient and hydraulic conductivity alone.~~

~~Constant head boundary conditions were assigned across layer 3 to simulate the vertical leakage from the Burro Canyon aquifer into the N-aquifer system, such that the only discharge points from the model are the bottom layer. A head value of 5,600 ft was assigned to the constant head cells across Layer 3 to simulate the head gradient within the Morrison Formation, between the Burro Canyon aquifer and underlying N-aquifer system. This head value represents the water level at the top of the N-aquifer, based on pre-pumping water levels of 5,750 ft observed in monitor well MW97-11 and 5,540 ft observed in monitor well MW97-7b and pumping well PW-8.~~

~~The simulations are documented in Arcadis's *Lisbon Valley Mine Updated Centennial Pit Backfill Evaluation* of March 2014, Whetstone's *Method and Results for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock* of March 2014, and Whetstone's *Method and Results for 2015 Geochemical Testing of Lisbon Valley Mine Waste Rock* of January 2016. The BLM's Backfill review and approval documentation are included in Appendix J.[13] Reference the Centennial Pit Backfilling documentation for current pit pool and water quality predictions related to the Centennial pit as described below.~~

- ~~Backfilling will prevent the accumulation of a pit pool, along with the associated evapo-concentration of salts. A pit pool, and the associated increases of total dissolved solids, is simulated to degrade the N-Aquifer under worst-case conditions. A pit pool is currently approved through Federal and State agencies.~~
- ~~Backfilling will prevent formation of any acidic condition, due to the acid-neutralizing characteristics of the backfill materials.~~
- ~~Backfilling will protect, and ostensibly improve, post-mine groundwater quality. Uranium concentrations in the backfill are predicted to be lower than the pre-mining uranium concentrations in groundwater. The raw unadjusted dissolved uranium concentrations ranged from 0.1376 to 0.1979 mg/L in the Bed 15 column leachates and from 0.0063 to 0.0125 mg/L in the Bed 15 column leachates. These values are lower than the average concentration of 0.341 mg/L in background well MW2A and substantially lower than the maximum value of 0.456 mg/L. These facts are documented extensively in the record.~~
- ~~The kinetic column testing suggests that the interaction of backfilled waste rock and rebounding groundwater will result in lower uranium concentration in groundwater than what was there historically.~~
- ~~The water quality in the backfilled pit is also expected to be significantly better quality than in a pit lake subject to concentration through evaporation.~~
- ~~The Burro Canyon aquifer is a perched, laterally discontinuous, aquifer with Class III groundwater that naturally exceeds drinking water standards. Protection limits for uranium in this aquifer are set in such a manner that no increase in concentrations is allowed. The results of kinetic column testing on proposed backfill material indicates that water quality in the column leaches has lower uranium concentrations than in the pre-mining groundwater.~~
- ~~Water quality outside of the Centennial Pit is generally of better quality, but remains~~
  ~~Class II. DWQ's understanding of the data submitted thus far indicates minimal offsite~~
  ~~migration will occur due to the compartmentalization and limited extent of both~~
  ~~the local perched aquifer and the deeper "regional" aquifer.~~

[13] ~~Lisbon Valley Mining Co 2015. Centennial Pit Partial Backfilling Revision 3 March 11, 2015~~

- ~~Modeling and kinetic column testing indicates that water quality will improve relative to the pre-mining baseline. Furthermore, a pit lake and the associated TDS increase will not occur.~~

~~Based on the above, UDEQ approved LVCM's backfilling proposal in a letter to the BLM.[14]~~

~~The anticipated impacts to the BC aquifer due to the dewatering of pits and extraction of groundwater for mineral processing include a reduction of the availability of ground water in the immediate project area (Adrian Brown Consultants 1996a) and the development of pit pools in the GTO and Sentential pits.~~

~~The shallow aquifer (BC-aquifer) will slowly recharge in the years following mining. Groundwater elevations, in the vicinity of the open pits, will never regain pre-mining elevations due to the annual evaporation of recharge water through the exposed pit walls and open pits. Potential impacts are tempered by the following: 1) the shallow aquifer (BC) is currently not used for any beneficial purposes, and 2) the water naturally exceeds the State of Utah drinking water standards for arsenic, uranium, TDS, radionuclides, and other parameters. Potential uses of the water are limited at present and would be similarly limited in the future. The backfilling of the Centennial pit will allow for the water level in the compartmentalized BC aquifer to recover in the immediate area. The backfill material is not expected to generate problematic groundwater chemistry. (BLM Centennial Pit Backfilling Mine Plan Modification for the Lisbon Valley Mine, San Juan County, Utah 2015)~~

~~The deeper aquifer (N-aquifer) will only be impacted by groundwater extraction as this aquifer is well is below the host material being mined. This aquifer will slowly recharge in the years following mining, however, initially less water will be available to move downgradient of the project site northeast toward the Dolores River. It is possible that flows in the Dolores River could be affected, however, the percentage of total flow in the Dolores River contributed by the deep aquifer in the Lisbon Valley area is very small and would likely be undetectable. (BLM FEIS 1997)~~

Surface water is protected by use of culverts, manmade and natural stormwater catchments, and manmade and natural drainages. To the extent possible, stormwater is diverted around the active mine area using existing natural drainage channels and culverts. Where stormwater falls within the active mine area, the stormwater is diverted to onsite manmade and natural catchments where it is either used in beneficiation or allowed to infiltrate or evaporate.

Long term mitigation from impacts to surface and ground water is accomplished during the final reclamation phase where the leach pad is removed from service, drained, neutralized and capped with clay, crushed rock and growth media. Further detail regarding the leach pad closure process can be found in Section 110 below and in Appendix I.

109.2 - Impacts to threatened & endangered wildlife/habitat

Wildlife inventories were evaluated in the February 1997 FEIS. The presence of wildlife in the Lisbon Valley area was characterized as "limited" due to the lack of potential food and water sources. There are five species of birds, two fish, one mammal, and one insect that are listed as sensitive, which may occur within the project area according to consultations with federal and state agencies.

These include:

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[14] ~~Utah Department of Environmental Quality 2014. Evaluation of Lisbon Valley Mining Company's Proposal to Backfill the Centennial Pit. 22 August 2014~~

- American Peregrine Falcon
- Bald Eagle
- Mexican Spotted Owl
- Ferruginous Hawk
- Loggerhead Shrike
- Black-footed Ferret
- Great Basin Silverspot

The Flora and Fauna Baseline Data by Woodward-Clyde in June of 1994 is located in Appendix F.

There are no endangered species on or around the Project boundaries.

The Company is actively engaged in updating the wildlife and vegetation data for the active mine area. This updated data will be made available to the Division and will be updated annually or on a frequency deemed appropriate by the Division.

Pit lakes are expected to form in both the Sentinel and GTO pits. Pit lakes will have neutral to mildly alkali pH, and evapo-concentrate to relatively high TDS and elevated cadmium, selenium, and uranium concentrations. (Whetstone Associates, Annual Update of the Lisbon Valley Hydrogeologic System Evaluation, September 2009). Potential positive impacts include an available water source for wildlife in an arid location and potential negative impacts could occur to avian fauna from landing in pit lakes. Monitoring of pit lakes will be conducted for 5 years post-mining and the Company will propose and implement corrective action if post-mining mortalities occur.

109.3 - Impacts on existing soils resources

Mining operations will be conducted in accordance with R647-4-107.3 Erosion Control. The Company's compliance with R647-4-107.3 helps minimize the loss of soil resources due to erosion. Erosion is the only anticipated impact on existing soils due to mining operations.

Soil resources are detailed in the February 1997 FEIS, the Baseline Soils Report by Woodward-Clyde in August of 1994 located in Appendix L, and the Reclamation Guidelines by WP Resources in October 2012 located in Appendix G. Soils are generally poor quality; however sufficient volumes are available for full reclamation of the active mining areas (minus pits). The LVCM has stockpiled soil and the Company has surveyed the volumes for final reclamation. Stockpiled soils will be placed away from active mining activity and seeded to minimize soil loss due to erosion. Refer to Map 5 located in Appendix C.

Salvageable growth medium (soil and vegetation) will continue to be grubbed from disturbed areas and stockpiled in the locations described in Section 106.5

109.4 - Slope stability, erosion control, air quality, safety

The Company manages the stability of three types of slopes on site; pit walls, waste dump, and leach pad slopes. Pit walls are designed to specifications of contracted geotechnical studies (Kenneth C. KO & Associates 1989, Call and Nicholas Inc. 1996, 2014). The Company practices ground control protocols to achieve final wall configurations in four steps: Presplitting, Trim Shooting, Wall scaling with dozer or backhoe and visual inspection. In case of mining in loose and weak rock formations such as shale that presplitting doesn't result in stable wall, larger benches and lower wall angles are implemented. Pit wall stability is monitored using high accuracy prism and reflectorless Total Station surveys. Pit walls are visually inspected by all trained personnel and supervisors for cracks and signs of unsafe wall movements in active areas.

Pit walls all have floor-to-crest angles of less than 45 degrees. This angle is deemed adequate for long-term stability by the Division. The Company modifies their mine plan to ensure pit walls are shallower than 45 degrees depending upon geologic conditions encountered during mining.

The leach pad is designed and intended to be built with operational slopes of 2.5H:1V constructed in terraces and a reclaimed continuous slope of 2.5H:1V, as recommended by a geotechnical survey performed by Golder Associates Inc, in 2006. As stated previously, some areas of the already-existing leach pad has operational slopes greater than 2.5H:1V. These slopes will be re-worked as needed during the continued construction of the leach pad. Leach pad slope stability is monitored using high accuracy prism and reflectorless Total Station surveys and visually by all trained personnel and supervisors for cracking and signs of instability.

Waste dumps B and C are sloped to 2.5H:1V except for a few slopes to be reclaimed. Dump A is designed to be sloped at 2.5H:1V with concurring reclamation as it is being built. The slopes of the waste dumps are visually monitored for instability.

The Company manages erosion from two main sources: wind and storm water. It is anticipated that the wind will blow dust from disturbed surfaces around and off the site. It is also anticipated that storm water will move sediment during rain events. Erosion control methods will be employed to help minimize erosion, as needed, while stable revegetation establishes following final regrading of the heap and dumps. Such methods may include the placement of straw waddles, re-ripping of areas along contour, regrading of significant rills, and otherwise reducing the length of continuous or uninterrupted slopes. See Map 4 in Appendix C for illustrative examples of the employment of these methods.

The Company manages two emissions impacting air quality: tail pipe emissions from equipment, both mobile and stationary, and fugitive dust. The Company maintains an Air Quality Permit administered by the Utah Department of Environmental Quality attached as Appendix E.

The Company manages multiple potential impacts to public health and safety including fugitive dust, water quality, site access, and hazardous materials.

109.5 - Actions to mitigate any impacts

Process Solution

Long-term effluent draindown will be monitored and controlled by the installation of Evapotranspiration (ET) cells. The effluent will be characterized by initiating quarterly and/or annual (as deemed appropriate by the Division and DWQ) Profile 1 water quality sampling of the effluent contained within the PLS and RAFF ponds. Anticipated long-term draindown water quality will be characterized by the implementation of humidity cell testing of existing stacked ore and fresh ore, as it is mined. The humidity cell testing will be run for a minimum of 20 weeks in order to approximate the potential remaining acid neutralizing capabilities of the ore would be upon completion of mining and leaching. These humidity cell tests will be performed for a range of ore material and already-stacked leached ore material to provide a relatively representative dataset of the leach pad in its entirety.

Pits~~Process SolutionPits~~

The rock at the Lisbon Valley Mine consists of massive sandstones, interbedded with shales and clays of varying thicknesses and consistencies. During mining all active high walls in the pits will be maintained at 20 or 40'high walls on an 18'batter with maximum 25'benches. The overall slope of these benched high walls will be 1H:1V or less. The unconsolidated alluvium on top of the lithic formation will be stripped to beyond the crest of the ultimate pit limits and used to supplement reclamation on waste dumps and other areas as needed. High wall inspections are completed on a daily basis by mine supervisory personnel, as well as MSHA inspectors twice annually. Berms will be constructed above the final pit walls to enhance public safety and to keep storm water runoff entering the pit.

The Centennial Pit will be backfilled to at least 6,200 ft amsl, which is 10 feet above the predicted post-mining ground water table. Pit lakes are anticipated to form in both the Sentinel West and GTO pits after mining has ceased. Pit lake modelling predicts lake water to have neutral to mildly alkali pH and will evapo-concentrate sulfate and carbonate ions, eventually reaching TDS concentrations as high as 6,000 mg/L and will develop elevated concentrations of cadmium, selenium, and uranium. Due to high evaporation, water from the Burro Canyon aquifer will flow one-way into the pit lakes, minimizing contamination of the aquifer. The pit lakes are underlain by approximately 1000 ft of low permeability shale, siltstone and silty sandstone (Morrison and Summerville formations). Minor leakage of pit lake water is expected to infiltrate faults and fractures, but pit lake water is expected to remain in pit lakes and not reach the Navajo Aquifer. The Sentinel West pit lake is seasonally intermittent and does not reach the high concentrations of TDS or metals. See *2018~~007 Annual~~ Update of the Lisbon Valley Hydrogeologic System Evaluation*. Long-term monitoring of pit lakes for impacts to wildlife will be conducted and no other mitigation measures are planned.

Waste dumps

The waste rock is comprised of the same sandstones, shales, and clays. It is reduced by blasting to an approximate 24" minus gradation. The waste is end-dumped on waste dumps and pushed with dozers as needed to a maximum slope of 2.5H:1V. LVMC will use slope breaks, ripping parallel to the slope, and roughed surfaces to enhance slope stability. Waste rock will be seeded to further increase stability during mine operation.

Waste dump A and any waste dump to be built, have concurrent reclamation during construction. By building short lifts and sloping benches during operation, the slopes are at reclaimed angle when each lift is constructed.

Storm water erosion

Storm water is managed in accordance with UPDES permit and the Storm Water Pollution Prevention Plan, attached as Appendix M. Storm water is diverted through the mine site to both reduce erosion and minimize storm water's interaction with chemicals and process water. Sediment traps and erosion control structures including, but not limited to, rock check dams and berms will be installed as necessary and or by condition of permits. Sediment traps may be expanded into larger basins to mitigate flooding in response to rainfall events. Refer to Map 4 located in Appendix C.

Wind based erosion

Will be managed in accordance with the air quality permit, attached as Appendix E. Wind erosion is managed by reclaiming disturbed areas, seeding growth media stockpiles, seeding waste dumps, and utilizing a water truck to keep mobile equipment dust to a minimum. Storm water erosion control will be provided by surface water diversions, sediment traps in conjunction to the aforementioned slope breaks, roughened surfaces, and maximum slopes.

Tail Pipe Emissions

LVMC complies with an air quality permit administered by the Utah Department of Environmental Quality, attached as Appendix E. All equipment used on the site is maintained according to a preventative maintenance schedule promoting optimal operation and minimal emissions.

Fugitive Dust

LVMC complies with the fugitive dust control plan and air quality permit administered by the Utah Department of Environmental Quality, attached as Appendix E. Dust is controlled by operation of water trucks and associated sprays. Opacity is monitored by visual observation.

Public Health and Safety

Public Health and Safety are a primary concern of the Company. The Company manages fugitive dust, as discussed in both the Erosion Control and Air Quality sections, by way of monitoring dust and reclaiming disturbed areas and the watering of roadways. The Company manages water quality in accordance with the state issued Groundwater Discharge Permit as discussed in section 109.1.2. The Company controls access to the site by way of fencing, berms, signage, 24hr/365day on site personnel and video surveillance. The Company manages hazardous materials by following permit conditions, MSHA, and EPA rules and regulations. The Company has HAZMAT trained personnel and only utilizes certified logistics companies. The pits will be bermed off to enhance public safety and to keep run off from surrounding areas from entering the pit directly. Exceptions to this may be a small drainage from the westernmost portion of C dump into the Sentinal West pit. This is still speculative, however, and may be removed as an option for long-term drainage control.

R647-4-110 - Reclamation Plan

110.1 Current Land Use and Post – Mining Land Use

The current land use in Lisbon Valley is mining, rangeland and wildlife habitat. Post-mining land use will be rangeland and wildlife habitat.

110.2 Reclamation of Roads, Highwalls, Slopes, Leach Pads, Dumps, Etc.

Roads, and other Ancillary Facilities

All surfaces, haul roads, and roads not deemed essential by DOGM or the BLM will be reclaimed. Reclamation will include ripping/re-grading, followed by topsoil placement, if necessary, and re-seeding. The ripping and/or re-grading of the haul roads and adjacent slopes (if applicable) will be performed to match surrounding terrain and surface conditions.

Highwalls

Highwalls in the Sentinel and GTO pits are mined to a general slope angle of 1.2H:1V. Highwalls in the Centennial pit are mined to a general slope angle of 1H:1V. Pit highwalls will remain at the mined slope of 1H:1V, or less. Thus far pit slopes have remained stable. The Centennial mine plan includes a layback on the south portion of the pit, which would put the post-mining highwall on the footwall side of a localized normal fault. This will add to the overall post-mining stability of the pit walls.

Centennial Pit

The Centennial pit will be partially backfilled so that no area of the pit is lower than the 6,200' amsl level as discussed in section 106.9. The mining sequence for the Centennial lends itself for ongoing backfilling so that upon completion of all mining activities, very little if any area of the pit will remain below the level of 6,200' amsl. Access to the pit will be blocked by placing berms and fences around the entire pit perimeter. Pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, and pit floors will be ripped and seeded. If excess topsoil exists after reclamation of the dumps, facilities, and heap leach pad, pit floors and access roads will also be topsoiled. ~~, covered with 12" of growth media, and seeded to promote healthy vegetation stands.~~ Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be potentially acid generating.

GTO Pit

The GTO pit will not be backfilled in the current mine plan and a pit pool is expected to develop. Access to the pit will be blocked by placing rock berms and fences around the entire pit perimeter. Pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, and pit floors will be ripped and seeded. If excess topsoil exists after reclamation of the dumps, facilities, and heap leach pad, pit floors and access roads will also be topsoiled.~~, covered with 12" of growth media, and seeded to promote healthy vegetation stands~~. Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be acid generating. The GTO pit is not a candidate for backfilling for multiple reasons including: the copper resource is not completely mined out and backfilling would preclude future development of remaining resource, deposit geometry does make pits that are conducive to backfilling, and the volume of waste rock required to backfill the GTO pit is not available in the mine plan.

Sentinel West Pit

The Sentinel West pit will not be backfilled and a pit pool is expected to develop. Access to the pit will be blocked by placing rock berms and fences. Pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, will be ripped, covered with 12" of growth media, and seeded to promote healthy vegetation stands. Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be acid generating. The Sentinel pit is not a candidate for backfilling for multiple reasons including: the copper resource is not completely mined out and backfilling would preclude future development of remaining resource, deposit geometry does make pits that are conducive to backfilling, and the volume of waste rock required to backfill the Sentinel West pit is not available in the mine plan.

For all pits, access will be restricted by installing berms around the entire perimeter and along all access points. Pit bottoms will be re-topsoiled and re-seeded where the pit bottoms are above the ground water elevation of 6,190 ft amsl and where excess topsoil exists. In the absence of excess topsoil, pit bottoms and access ramps will be ripped, scarified and reseeded.

Drainages

Drainages will be reclaimed and rebuilt at the end of the mine life to maintain drainage continuity and minimize erosion. Sediment traps and erosion control structures, including rock check dams, may be expanded as necessary based on drainage monitoring in accordance with the SWPPP. Refer to Map 4 located in Appendix C and Appendix M. During construction of the roads and process areas, culverts were installed throughout the active mine boundary. These culverts ~~Culverts installed under roads constructedplaced in the drainages around the site which were installed by the Company and used during operations~~ will remain in place as part of the post-reclamation drainage control process if deemed necessary. Culverts identified for post-mining use are seen in Map 4 and Map 5 of Appendix C.

Waste Dumps

The Company's waste dumps are completed with breaks in slopes, roughened slopes and maximum slope angle 2.5H:1V. Surface water is or will be diverted around the dumps where possible. Dump tops will be sloped to drain away from dump edges toward a centralized catchment sump. The overall waste dump slope lengths will be broken up by catchment benches as needed to prevent terminal velocity of rainwater runoff to occur. For Waste Dump C, up-gradient riprapped channels will be installed to capture most of the intercepting waters. A riprapped drainage design for the Waste Dump C has been engineered in February 2020, and the Company commits to installing the drainage and associated catchments in 2020-2021. The water thate does fall will continue to follow the set course, with the modification of the drainage channels per Map 5. Maximum continuous slope angles are identified on Map 5.

The Company will concurrently reclaim dumps as they are completed. This will include grading to a final contour that maximizes conformance with existing topography. Roughened surfaces are created by ripping along contour to approximately 1.5' in depth. ~~The equipment performing the ripping will have a seeder attached to the back to efficiently place the seed in the freshly ripped grooves. Seeding activities will be scheduled for the fall when possible.~~ Rilled areas will be backfilled and repaired as necessary during the mine life.

Final surface reclamation will include the placement of 12" of growth media, seeding and revegetation. The exception to this is those areas of the Waste Dump C that have revegetated to a level where disturbance to place topsoil would not be considered Best Management Practice. In this case, Waste Dump C will remain with the existing vegetated areas, and only those areas approved by the Division for re-disturbance will be re-graded, topsoiled, and re-seeded.

The landfill located on Waste Dump A will be reclaimed as follows (Permit #1902):

When the operational life of the landfill facility has ended, final capping will be accomplished using acid neutralizing waste rock from the surrounding Waste Dump 'A'. The final cover will be no less than 24" in thickness. Following the final capping, topsoil will be spread to a depth of no less than 12" on top of the capped landfill. The topsoil will be taken from the topsoil stockpile located north of Waste Dump A.

Topsoil placement will likely occur in fall of the reclamation year. This will be done to allow for re-seeding of the area in late fall, which is the preferred re-seeding season. The seed mixture to be used will be approved by DOGM, BLM, and SITLA.

Seeding in all areas of the active mine plan boundary will be performed using either aerial seeding, broadcast seeding, or other methods that have been proved to have viability within the LVCM.

Heap Leach Pad

NOTE: all data contained herein and in referenced Appendices is preliminary only. A final heap closure plan will be finalized prior to reclamation and in coordination with the Company, the Division, and DWQ. In any event, recirculation of heap fluids will continue until heap closure activities commence. This activity will mirror the events as they occurred at the Operation between March and June 2020.

Reclamation of the Heap Leach Pad will follow the guidelines set forth in the original 1997 Record of Decision for the Lisbon Valley Copper Project, and updated to reflect current known Best Available Control Technology (BACT). The updates as known currently include the draindown of effluent, re-grading the pad slopes to a final 2.5H1V, capping the entire surface with 3' of inert waste, and applying a final cover of 12" of topsoil to all slopes and top. Long-term draindown evaporation cells will be constructed in the ILS, PLS, RAFF, and Stormwater Ponds, and the 100-yr emergency pond will be left temporarily unreclaimed for post-closure sediment control.

Data gathered from the humidity cell testing will provide the Company with adequate data on the long-term neutralization potential of the leached ore. Depending upon the results gathered within the first year of re-commencement of mining operations, a post-mining effluent neutralization plan may be proposed by the Company.

To ensure long-term stability and reduced overall draindown, the leach pad surface will be graded to minimize infiltration. Map 5 details the post-reclamation grading plan for the leach pad. As seen in Map 5, the leach pad will consist of a series of crowned terraces that will drain outward to designated drainage channels and eventually report to the designated stormwater catchment areas.

Details on the stages and timing for leach pad draindown and final reclamation are found in Appendix I. As stated previously in this Notice, an updated GWDPA is being provided to the ~~U~~DWQ. Therefore, any previous assumptions for the closure and post-closure of the LVCM, especially as it pertains to the heap leach pad, is superseded with this Notice and associated GWDPA.

Solution and Storm water ponds

The solution and stormwater ponds (PLS, ILS, RAFF, and Stormwater Pond) will be converted into post-closure evaporation cells. Detailed information on the design and proposed construction of the evaporation cells is found in Appendix I.

The 100-yr pond will be left unreclaimed for post-mining emergency storm water controls. Once draindown has reached a stable condition and the heap leach pad surface has been reclaimed and deemed stable, the 100-yr pond will be reclaimed by folding in the HDPE liner and pushing material to create a more natural-looking stormwater collection area.

The three manmade storm ponds (haul road pond and two GTO ponds) will be reclaimed by pushing material back into the ponds. As no HDPE or other liner material was used in the construction of these ponds, no further reclamation treatments are proposed. Upon regrading the ponds, the areas will be re-seeded.

Drainage Channels

Drainage channels will be constructed as stated above for the waste dumps and heap leach pad reclamation. Other drainages will be constructed to ensure stormwater runoff does not accumulate near pit walls, where seepage could create a potential highwall failure.

The section of surface water drainage that runs along the southern edge of the Sentinal West pit will be re-designed and re-constructed farther to the south to ensure that water does not accumulate near the pit walls. This drainage will connect the Waste Dump C drainage channels and the north leach pad drainage channels to the existing Little Valley ephemeral drainage. Culverts are already installed by San Juan County that connect these drainages together. Information on the size of these culverts is being gathered to ensure that the re-designed section meets flow requirements for a 100-yr 24-hr storm event.

Drill Holes

Any exploration and development drill holes remaining outside the pits at the mine will be abandoned in accordance with R647-4-108. Any remaining production and monitoring wells will be abandoned by a Utah state licensed contractor in accordance with R655-4-14.

110.3 Surface Facilities to be Left

~~The three Stormwater collection ponds such as the haul road pond and two GTO ponds will be left in place post-closure. These ponds are used by wildlife as a drinking water source, and their continued presence will provide a continued source of drinking water that will help deter wildlife from seeking entry to the 100-year storm pond or evaporation cell.~~

~~The 100-year storm pond would be left temporunreclaimed and would be converted into a long-term diversion pond for the heap leach pad.~~ The solution ponds and stormwater pond (PLS, ILS, RAFF, Stormwater Pond) will be converted to long-term evaporation cells. The purpose of leaving the~~both the 100-year pond and~~ evaporation cells is to ensure any effluent and/or sediment that may continue to drain from the pad is captured and contained for evaporation and catchment purposes. Detailed designs of a post-closure long-term monitoring plan would be submitted to the Division during the first year of closure activities. Because the ponds will be the last facilities to be reclaimed, and because it is anticipated that the heap leach pad will continue to be monitored post-reclamation, the first year of closure activities will help provide the Division and the Company with sufficient data to design and implement any required post-closure long-term monitoring plan. The Company has updated the Leach

Pad Drain Down plan and post-mining reclamation of the heap leach pad with the data learned during the periods of March 2020 and June 2020. During this period, the Company experienced a reclamation scenario. Detailed information on the draindown, evaporation, pump rates, pH, and other factors were recorded daily. This information has allowed the Company to formulate an actual, real-life simulation for the closure and post-closure monitoring of the heap leach pad. This information and the closure simulation data is found in Appendix I.

~~A small substation located northwest of the 100-year storm pond will be left post-closure. The reason for this is to provide power to the evaporation cell. The power consumption of the evaporation cell is expected to be minimal, and options of solar-powered devices are being reviewed.~~

Other than the existing ponds and facilities mentioned above, all surface facilities will be removed or demolished. Surface facilities will include the SX/EW, AST's, Truck Shop, Maintenance Shop, Laboratory, and Administration Office. No chemical or electrical hazards will remain after closure. All buildings and other facilities will be dismantled and removed from the site or buried onsite in a permitted land fill. Refer to Map 5 in Appendix C. Foundations will either be removed and buried elsewhere on the site or buried in place. Facility areas will be contoured to create a natural appearance and to minimize erosion.

A UDEQ pre-demolition inspection to identify and quantify any asbestos-containing materials per R307-801 and all universal hazardous wastes will then be quantified, removed, and disposed of properly before demolition as per R315-16.

Post-Closure Management of Fences, Berms, Signs and Treatment Systems

Fences, berms, signs and treatment systems will be monitored and maintained as needed during the post closure 5-year water quality monitoring.

110.4 Treatment, Location, and Disposition of Deleterious Materials

The Company has multiple deleterious materials onsite including: waste rock beds 3-10, reagents, fuels, oils, acid, lead fake, and spent ore. The Waste Rock Management Plan in Appendix D includes "as-built" plan views of waste dumps with encapsulated material identified. The Site Facilities Map in Appendix C includes the locations of reagents, fuels, oils, acid, lead flake and spent ore. The Company recycles the lead flake on a quarterly or as-needed basis. The Company receives spot price income for the sale of the lead flake to Doe Run. In regard to solvents, upon closure all remaining solvents will be removed from site.

Waste Rock Selective Handling

Acid generating and uncertain waste rock that is not economically backfilled into the Centennial pit will be isolated during standard mining operations within the waste dumps and effectively neutralized by encapsulation inside waste rock with a NPR three times the acid generation potential. Encapsulation thickness will include 40' of buffer material on all surrounding portions of the acid generating and uncertain waste rock. Waste dump surfaces will be sloped to 2.5H:1V and revegetated to stabilize the slopes and minimize erosion. The proportion of neutralizing waste relative to waste with acid generation potential provides the Company with a high level of confidence that waste dumps will remain pH-neutral for perpetuity. This discussion is expanded in the Annual Waste Rock Monitoring Report. The Waste

Rock Management Plan in Appendix D includes "as-built" plan views of waste dumps with encapsulated material identified.

Reagents, Fuels, Oils, and Acid

A listing of reagents, fuels, oils, and acid used by the Company is provided within Table 14. All reagents, fuels, oils are contained in tanks. Acid is contained in tanks and the leach circuit. All tanks are contained in secondary containment. Refer to Map 2 Appendix C.

Upon closure, the SX/EW circuits will be isolated. All acid and acidic/copper-laden (non-hydrocarbon) solvents will be drained into the solution ponds for recycling onto the heap leach pad as part of the closure plan. All hydrocarbons and organic solvents (including used oil, diesel, unleaded gasoline, etc.) will be isolated in their respective tanks and stored until removed by a certified hydrocarbon recycling company.

Process Tanks
SX Acid Tank
Loaded Organic Tank (North)
Loaded Organic Tank (South)
Electrolyte Recirculation
Filter Feed Tank
SX Drain Tank
Disep Electrolyte Filter
Crud Cone Tank
Crud Org Recycle tank
Crud Pre Coat Tank
E-1 Extractor Settler
E-2 Extractor Settler
S-1 Stripper Settler
E-1 Primary Mix Tank
E-1 Aux Mix Tank
E-2 Primary Mix Tank
E-1 Aux Mix Tank
S-1 Mixer Tank
Hot Water Tank
Organic Skimmer Tank
Acid cure tank (4)
RO permeate Tank
SX Diesel Tank
SX Diesel Tank
SX Filter (3)
Plant water Tank
Truckshop Tanks
Diesel
Unleaded

Used Oil (4)
Used Coolant

Table 14
Reagent, Fuel, Oil and Acid Tank List

Spent Ore

The Company mines ore and sends it to the leach pad. Once the ore is placed on the leach pad, it will stay there. After all of the economic mineral is extracted the ore will be considered spent ore. The spent ore will stay in its original location on the leach pad after the final drain down. The slopes of the leach pad will be pushed down to a 2.5H:1V slope. The leach pad will undergo reclamation as detailed in Appendix I. Refer to Map 5 located in Appendix C for reclamation and topsoil placement practices.

Process Solution

The Company has developed a Process Fluid Management Plan and Closure Plan for the handling of process solutions both during operations and during closure and post-closure activities. These Plans are found in Appendix I. Long-term process solution chemistry will be quantified by the employment of Profile 1 tests on PLS and RAFF solution, as well as Profile 1 tests on the Humidity cell drained solution during the first week and every fourth week subsequently. Based upon the data gathered by the Company within the first year of re-commencement of operations, the process fluid management plan will be modified.

Upon closure of the operations, the Company will continue to recirculate process solution onto the leach pad while closure activities and enforced evaporation methods are employed. Historic process solution has fluctuated between 20,000 and 35,000 ppm tds based on a pH between 1.4 and 2. Recent shutdown data shows that effluent pH rises above 2. The final effluent quality is anticipated to remain slightly acidic with elevated TDS as high as 20,000 ppm. Heap closure will maintain the current drainage regime. The underlying liner slope promotes water flow to the northeast and into the existing process ponds. Any solution from the south slope of the heap is conveyed toward the east side of the pad and from there north to the process ponds.

To ensure process solution quantities are reduced as quickly and efficiently as possible, the Company will implement enforced evaporation techniques that may include enhanced evaporation nozzles such as BETE © or large blowers such as Slimline ©. The process solution will be evaporated on the leach pad surface and process ponds and will be evaporated until remaining draindown solution can be managed by the ET cells.

The PLS, ILS, RAFF and Stormwater Pond will be converted into ET cells by first placing 3’ of sand from crusher reject material in the bottom of the dried ponds. This layer will protect the HDPE from the rock layer. Next, 8’ of rock will be placed in the cells on top of the 3’ cushion layer. The rock will act as a permeable layer with large void space for fluid storage. The rock layer will be capped with 1’ of sand that will act as a capillary layer between the rock and the capping growth media. Finally, the ET cells will be capped with 2’ of growth media. While the purpose of the ET cells is to allow for enhanced fluid dispersal through transpiration, the elevated TDS of the process solution may not support plant growth. Sturdier plants and other methods of final capping will continued to be evaluated as the results from the humidity cell tests provide a more adequate representation of the post-closure draindown solution chemistry.

110.5 Re-vegetation Planting Program and Topsoil Re-distribution

Grading and Stabilization Procedures

Grading and stabilization procedures are described throughout this section.

Top Soil Material Replacement

Growth media will be spread over the waste dumps, leach pad, and , where additional topsoil exists, along haul roads and pit floors. Growth media will be spread ~~accessible in pit haul roads~~ using loaders, haul trucks, bulldozers, and graders. Growth media will be spread to a depth of 12" unless otherwise delineated within this Notice and Map 5, Appendix C. Marked lathe will be used to assist equipment operators in maintaining 12" of depth. Pit highwalls ~~and floors~~ will not be covered with growth media.

Seed Bed Preparation

Growth media will be spread in the same way for all of the reclamation across the site. Waste dumps may have additional roughening to the surface, ~~including dozer basins,~~ ripping parallel to slopes and track packing perpendicular to slopes. The leach pad will have a cap of 3' of inert waste and/or alluvium (or a mixture of the two, depending upon availability and recommendations from DWQ) which will have light ripping on the surface and parallel to slopes ~~and track packing perpendicular to slope will be used to create seed beds~~. Rilled areas will be backfilled and repaired as necessary during the mine life.

Final surface reclamation will include the placement of 12" of growth media, seeding and revegetation to a minimum of 70% of the baseline vegetation cover.

Seed Mixture

Table 15 provides an updated seed mix that was provided by the Division. This seed mix must be approved by the BLM prior to use in final reclamation on federal lands. For reclamation located on private and SITLA lands, this seed mix will be used. ~~The Company uses two seed mixes for reclamation of two distinct areas. The valley floor seed mix as seen in Table 15, is used for the majority of reclamation activities around the site as the majority of the project is located in the center of the valley. This seed mix was recommended by WP resources in the Reclamation Guidelines October 2012 and is located in Appendix G. The rocky foothills seed mix as seen is Table 16, is used where the valley floor transitions to the rocky cliffs of the canyon walls. Mike Bradley of Utah Division of Oil Gas and Mining recommended and approved the rocky foothills seed mix October 3, 2014, and Doug Rowles of BLM approved this mix October 7, 2014. Seed mixes may be adjusted based on availability at the time of reclamation. The BLM and DOGM will be consulted for approval prior to seeding with any adjusted seed mixes.~~

Common Name	Scientific Name	PLS lbs	Seed/lb	% of mix
Grasses				
Siperian Wheatgrass	Agropyron fragile	2	6.26	9%
Crested Wheatgrass	Agropyron cristatum	1.5	5.31	8%
Thickspike Wheatgrass	Elymus lanceolatus	3	9.13	13%
Galleta	Pleuraphis jamesii	2	5.8	8%
Indian Ricegrass	Achnatherum hymenoides	3	8.87	13%
Forbs/Wildflowers				
Western Yarrow	Hchillea millefoliom	0.25	16.98	25%
Annual Sunflower	Helianthus annuus	1	1.23	2%
Palmer Penstemon	Penstemon palmeri	0.5	5.61	8%
Alfalfa	Medicago sativa	1	4.75	7%
Yellow Sweetclover	Melilotus officinalis	0.5	2.67	4%
Shrubs				
Fourwing Saltbrush	Atriplex canescens	1.5	0.75	1%
Low Rabbitbrush	Chrysothamnus viscidiflorus	0.25	0.9	1%
Winterfate	Ceratoides lanata	1	0.38	1%
Shadscale Saltbrush	Atriplex confertifolia	1	0.4	1%
	Total lbs/acre	18.5	69.04	100%
	Seeds/sq ft.	69.05		

~~Common Name~~	~~Scientific Name~~	~~Variety~~	~~PLS lbs~~	~~Seed/lb~~	~~% of mix~~
~~**Grasses**~~					
~~Sandberg's bluegrass~~	~~Poa secunda~~	~~UP Colorado~~	~~0.5~~	~~925000~~	~~14~~
~~Galleta grass~~	~~Hilaria jamesii~~		~~1~~	~~170000~~	~~5~~
~~Indian ricegrass~~	~~Oryzopsis hymenoides~~	~~Rimrock~~	~~4~~	~~183000~~	~~21~~
~~Blue grama~~	~~Chondrosum gracile~~	~~Hachita~~	~~1~~	~~825000~~	~~24~~
~~Sand dropseed~~	~~Sporobolus cryptandrus~~	~~UP Dolores~~	~~0.1~~	~~5298000~~	~~16~~
~~**Forbs/Wildflowers**~~					
~~Annual sunflower~~	~~Helianthus annuus~~		~~3~~	~~58500~~	~~5~~
~~Gooseberry leaf globemallow~~	~~Sphaeralcea grossulariaefolia~~		~~0.2~~	~~500000~~	~~3~~
~~**Shrubs**~~					
~~Four wing saltbush~~	~~Atriplex canescens~~		~~3~~	~~52000~~	~~5~~
~~Winterfat~~	~~Ceratoides lanata~~		~~0.2~~	~~56700~~	~~0.3~~
~~Sagebrush~~	~~Artemisia tridentata var vaseyana~~		~~0.1~~	~~2500000~~	~~7~~
		~~total lbs/acre~~	~~13.1~~		
		~~Seeds/sq ft.~~	~~78~~		

Table 15

~~Valley Floor Seed Mix~~

¶

~~Common Name~~ ¶	~~Scientific Name~~ ¶	~~Seed Rate (lb PLS/ac)~~ ¶
~~Winterfat~~ ¶	~~Krascheninnikovia lanata~~ ¶	~~0.25~~ ¶
~~Sand bluestem~~ ¶	~~Andropogon hallii~~ ¶	~~4~~ ¶
~~Arizona fescue~~ ¶	~~Festuca arizonica~~ ¶	~~1.5~~ ¶
~~Muttongrass~~ ¶	~~Poa fendleriana~~ ¶	~~1.25~~ ¶
~~Blue grama~~ ¶	~~Bouteloua gracilis~~ ¶	~~1~~ ¶
~~Bluebunch wheatgrass~~ ¶	~~Pseudoroegneria spicata~~ ¶	~~1~~ ¶
¶	~~Total~~ ¶	~~9~~ ¶

~~Table 16~~ ¶

~~Rocky Foothills Seed Mix~~

Seeding Method

The seeding method will vary and include broadcasting, drill seeding, and aerial seeding with the objective to meet the reclamation standard of 70% of the baseline vegetation cover.

Fertilization

No fertilizers will be used.

Timing of Seeding

Seeding will be conducted in the fall up and until snow begins to accumulate.

110.6 Commitment statement

The Company is committed to successful reclamation of the mine site with a minimum of 70% of the baseline vegetation cover. Concurrent reclamation, permit compliance, and surety demonstrate this commitment.

R647-4-111 Reclamation Practices

During reclamation activities the Company will conform to the practices listed under R647 section 111 unless the Division grants a variance in writing.

R647-4-112 Variance

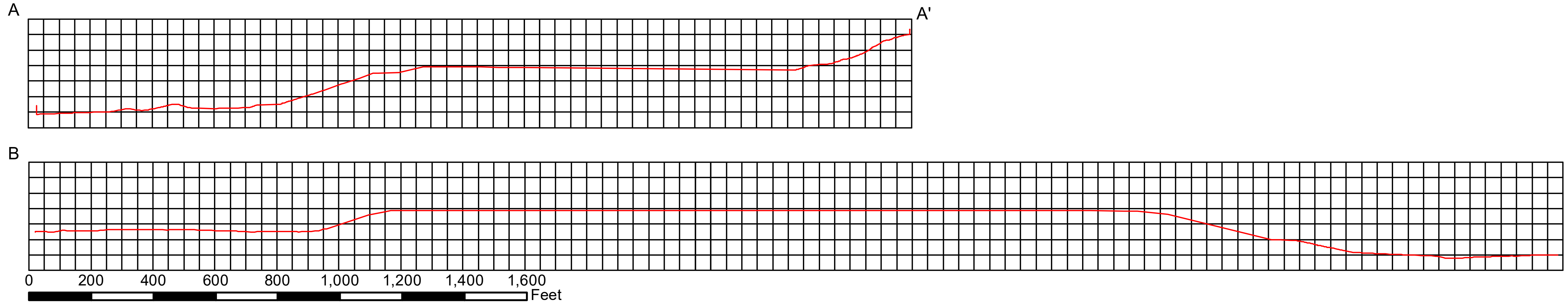
The Company is not requesting a variance from R647 at this time.

R647-4-113 Surety

The Company is actively engaged with the Division for the formulation of an up-to-date reclamation cost estimate. This RCE will be used by the Company and will be adjusted accordingly as new technology and information becomes known.

R647-4-114 Failure to Reclaim

The Company understands the implications if they fail to reclaim.



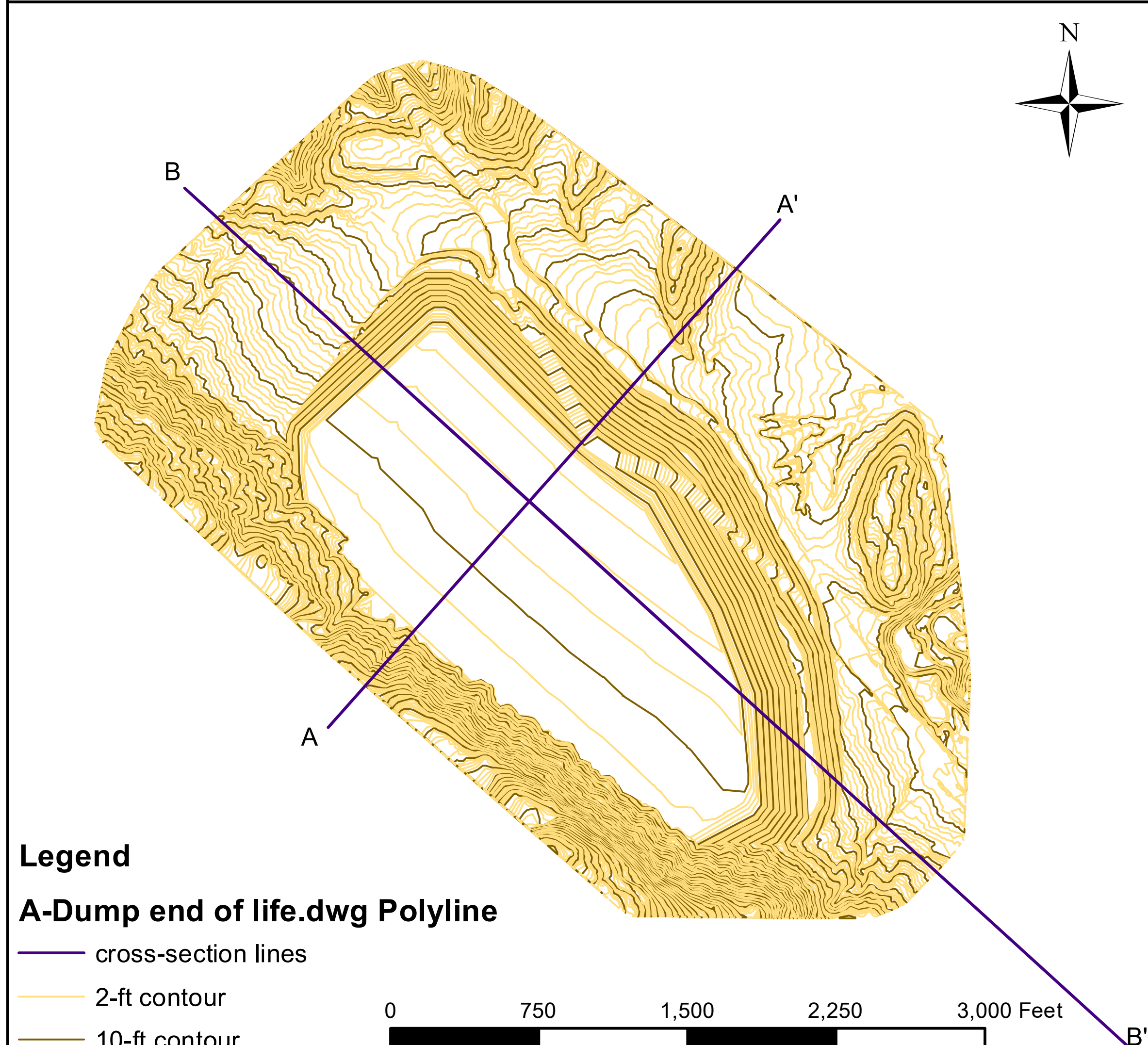


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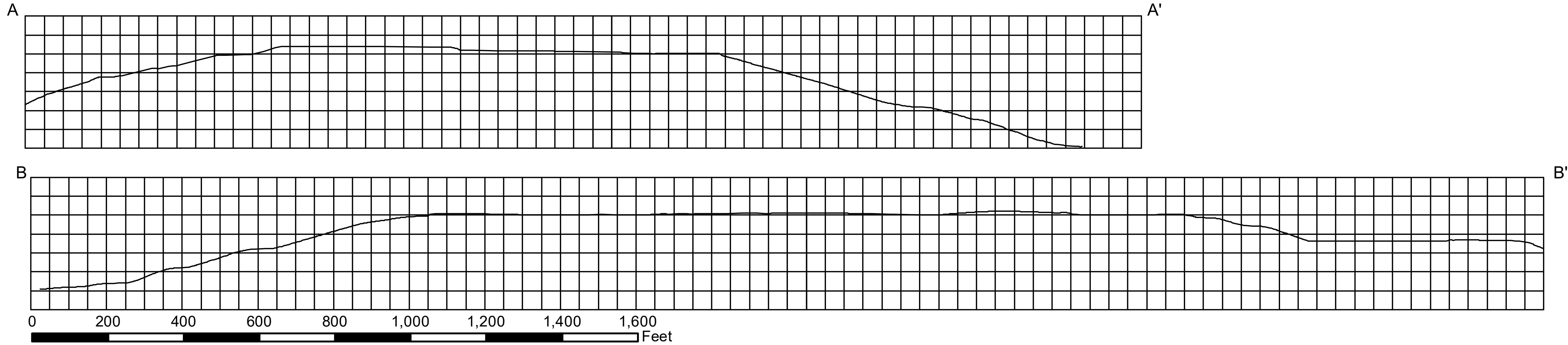
FIGURE 4

A Dump Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



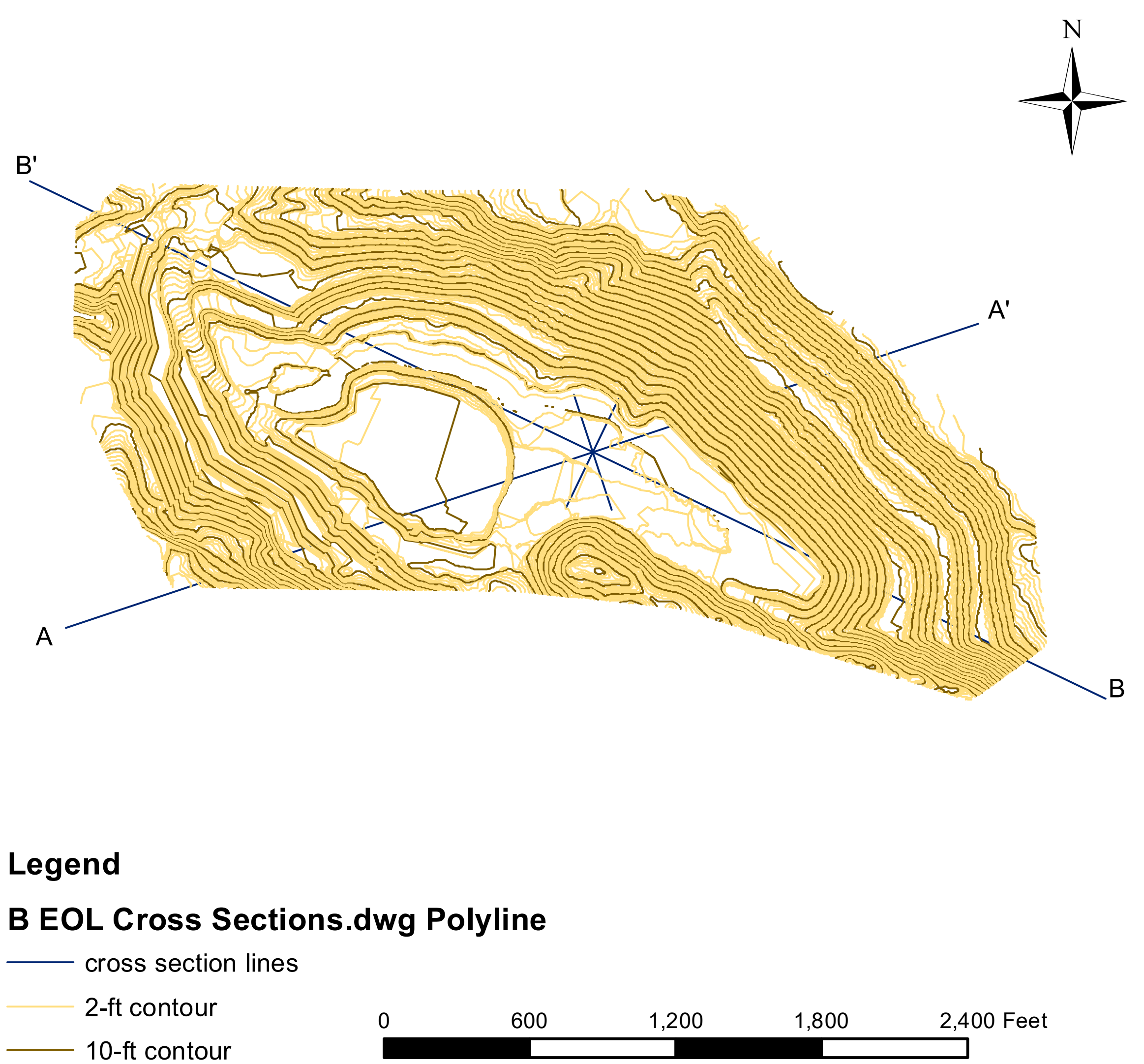


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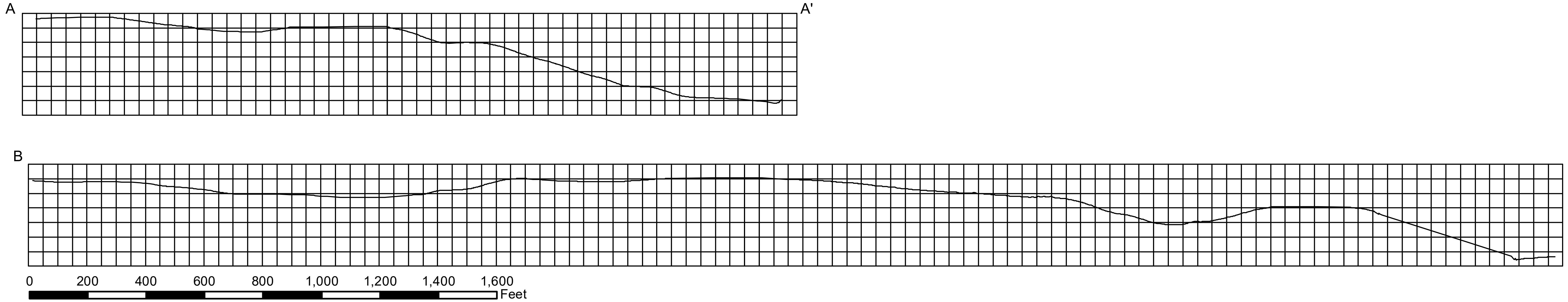
FIGURE 5

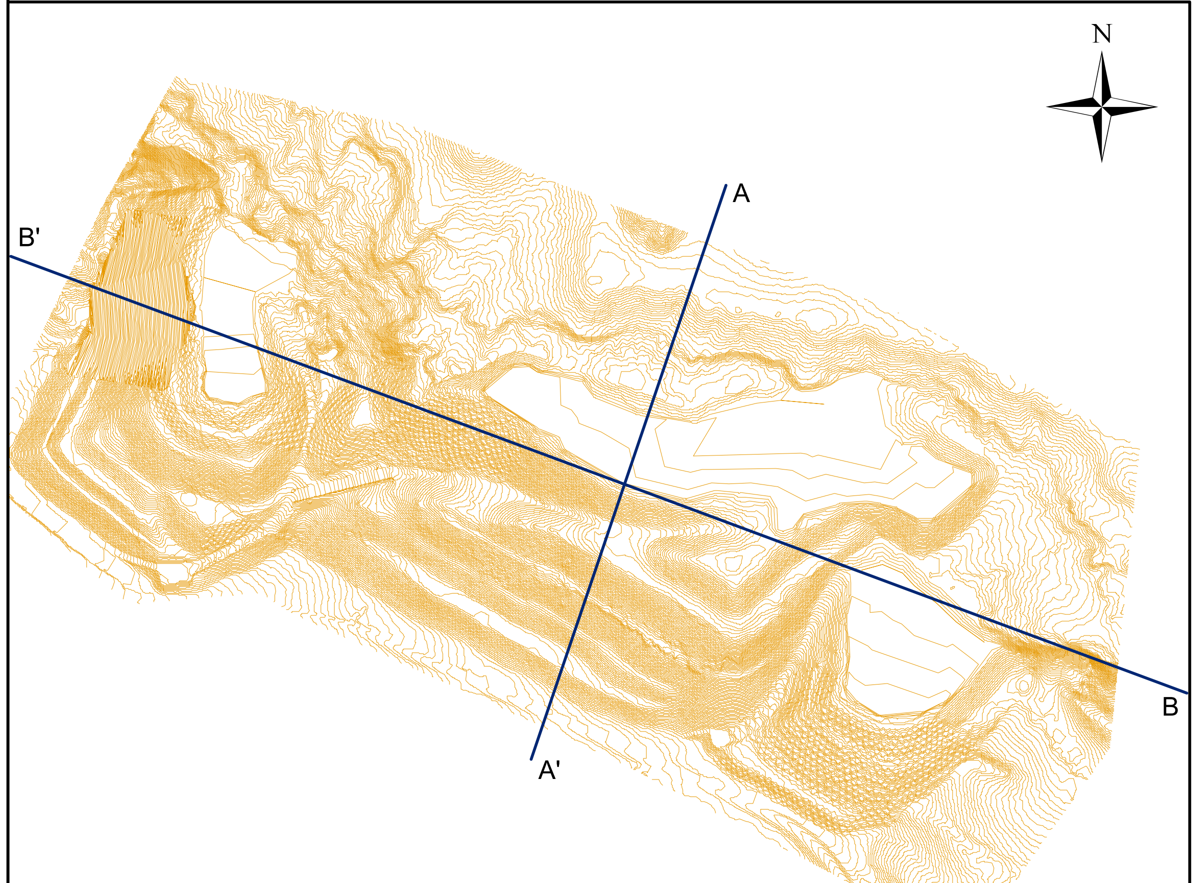
B Dump Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020





Legend

C Cross Sections.dwg Polyline

cross section lines

2-ft contour

0 750 1,500 2,250 3,000 Feet

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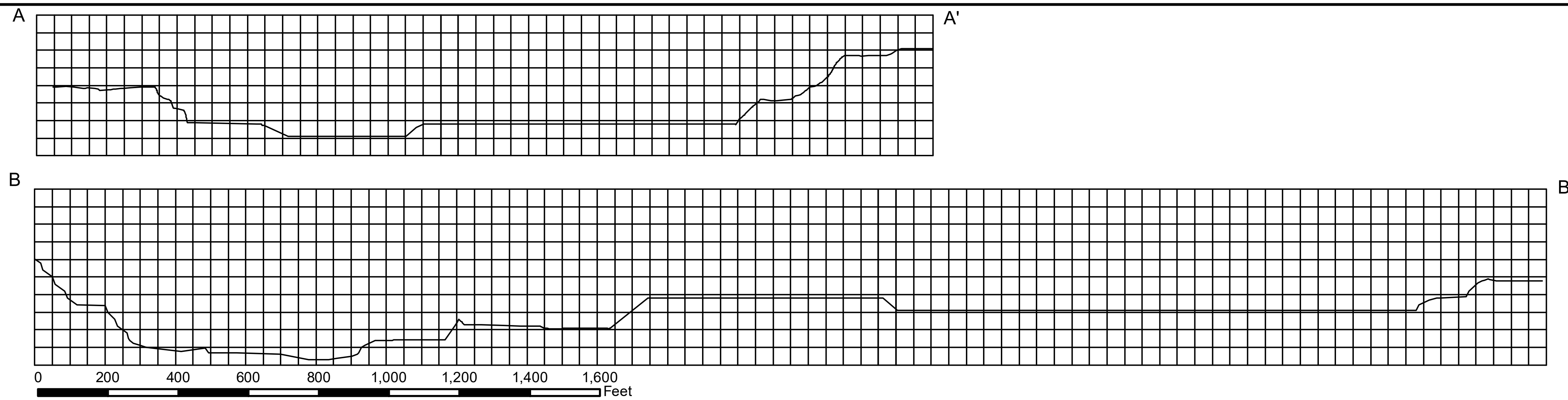
FIGURE 6

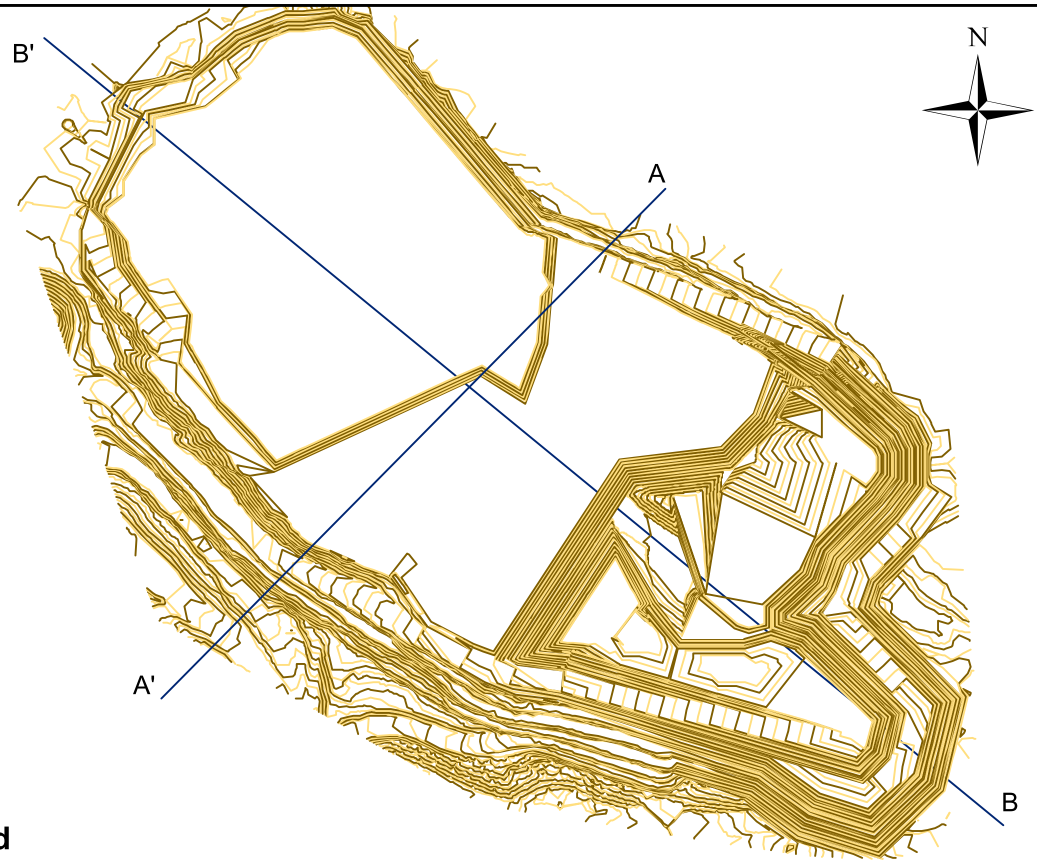
C Dump Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020





Legend

Cent EOL Cross Sections.dwg Polyline

Cad Renderer

- cross section lines
- 2-ft contour
- 10-ft contour

0 600 1,200 1,800 2,400 Feet

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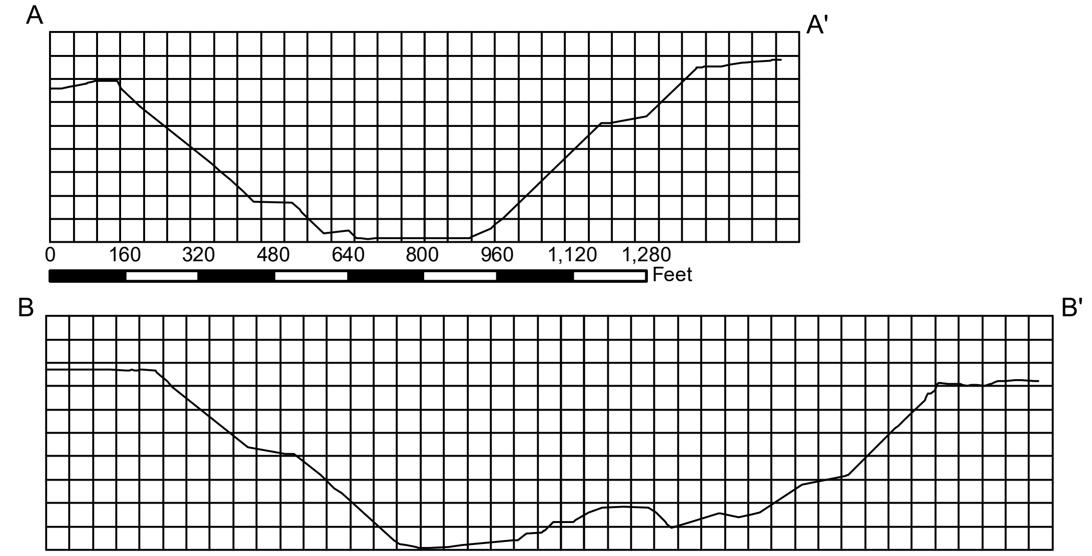
FIGURE 7

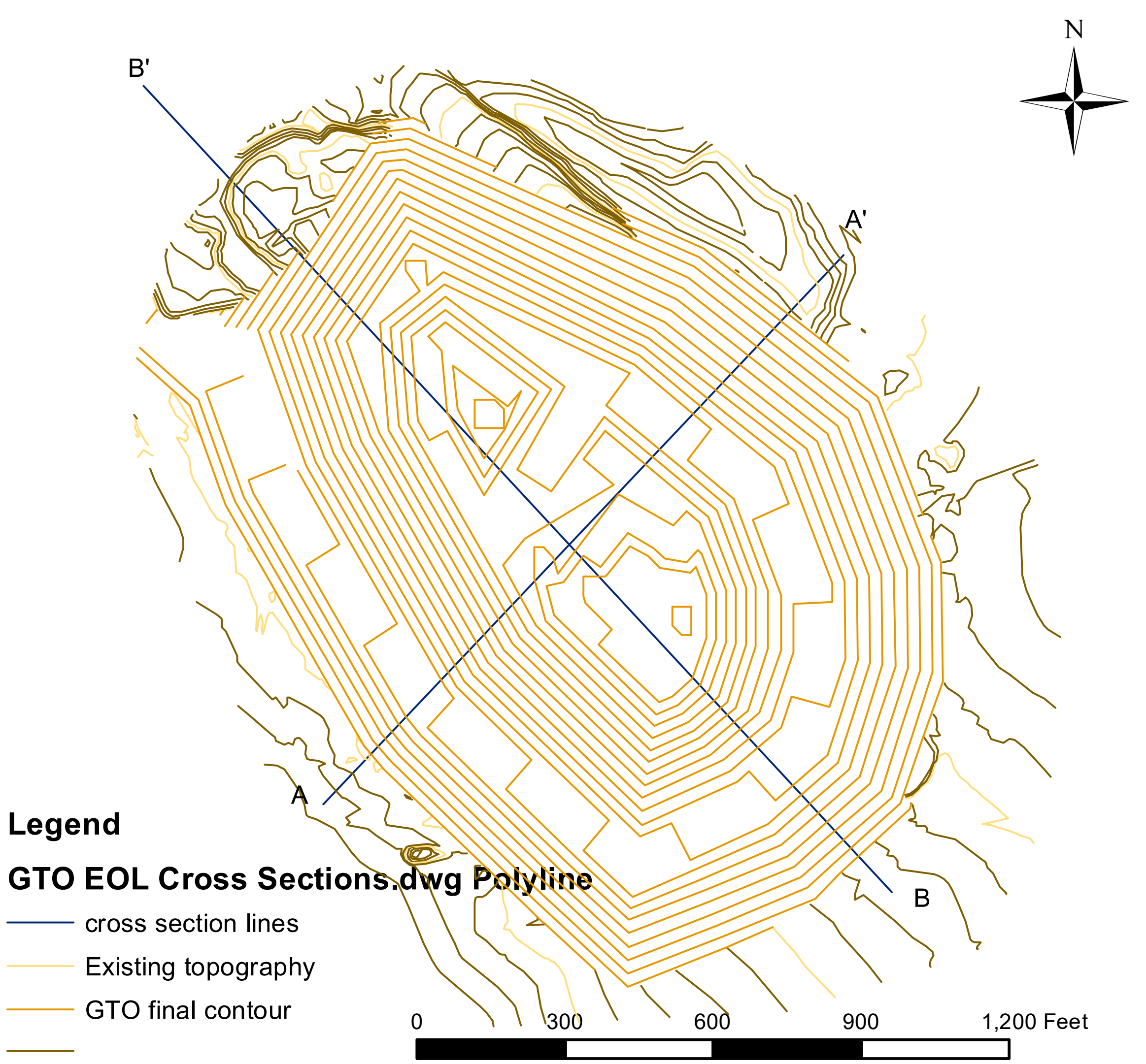
Centennial Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020





Legend

GTO EOL Cross Sections.dwg Polyline

- cross section lines
- Existing topography
- GTO final contour

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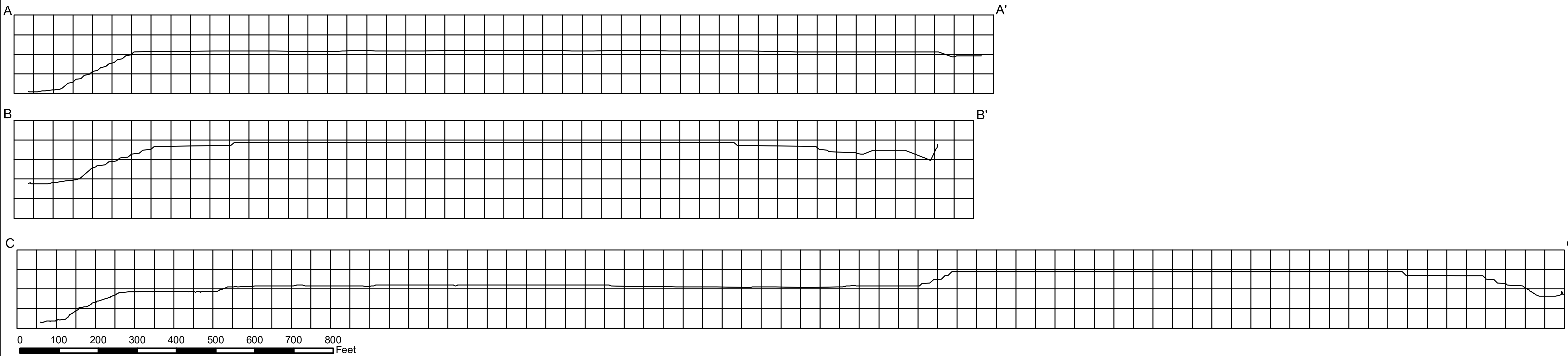
FIGURE 8

GTO Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



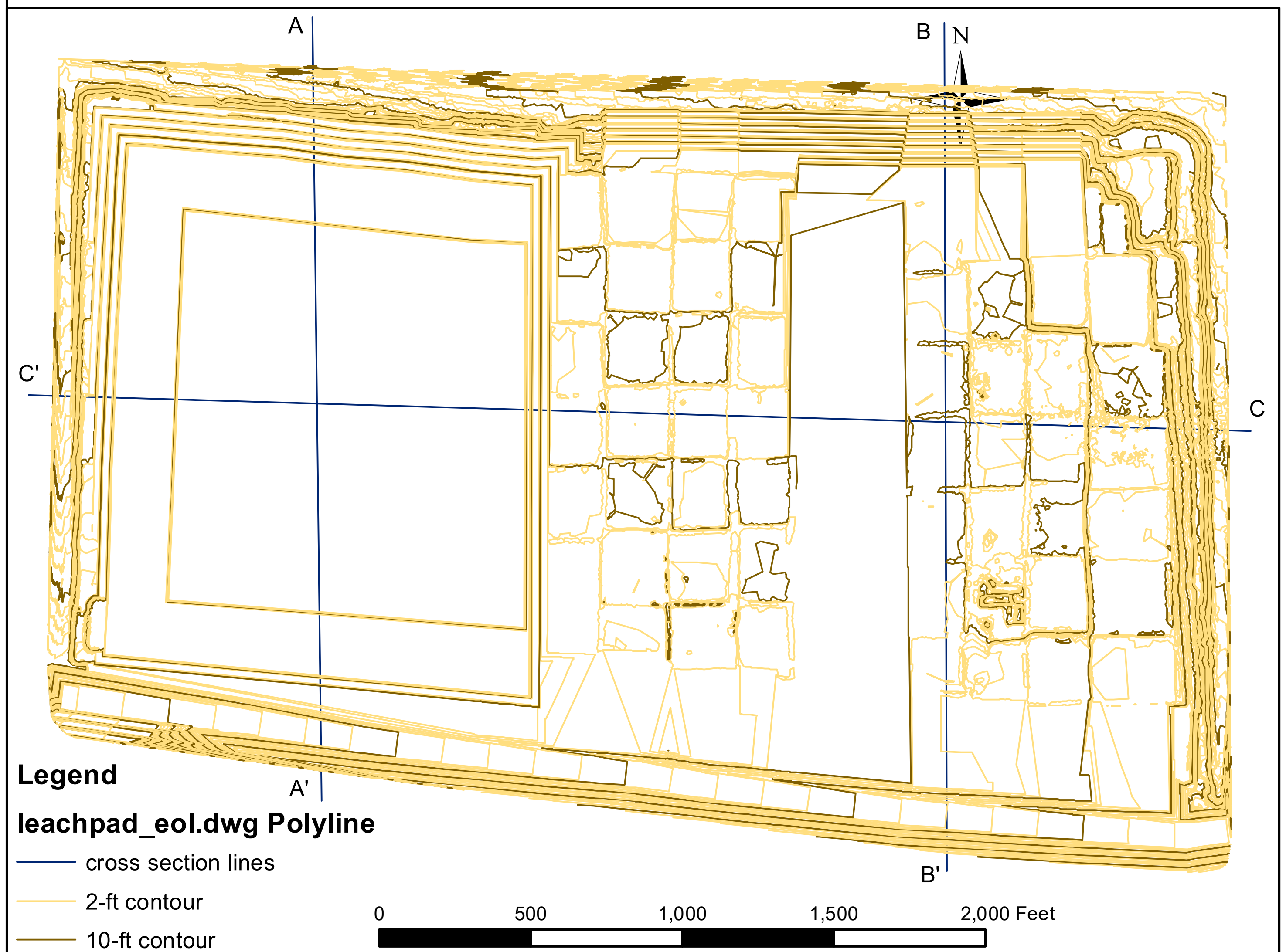


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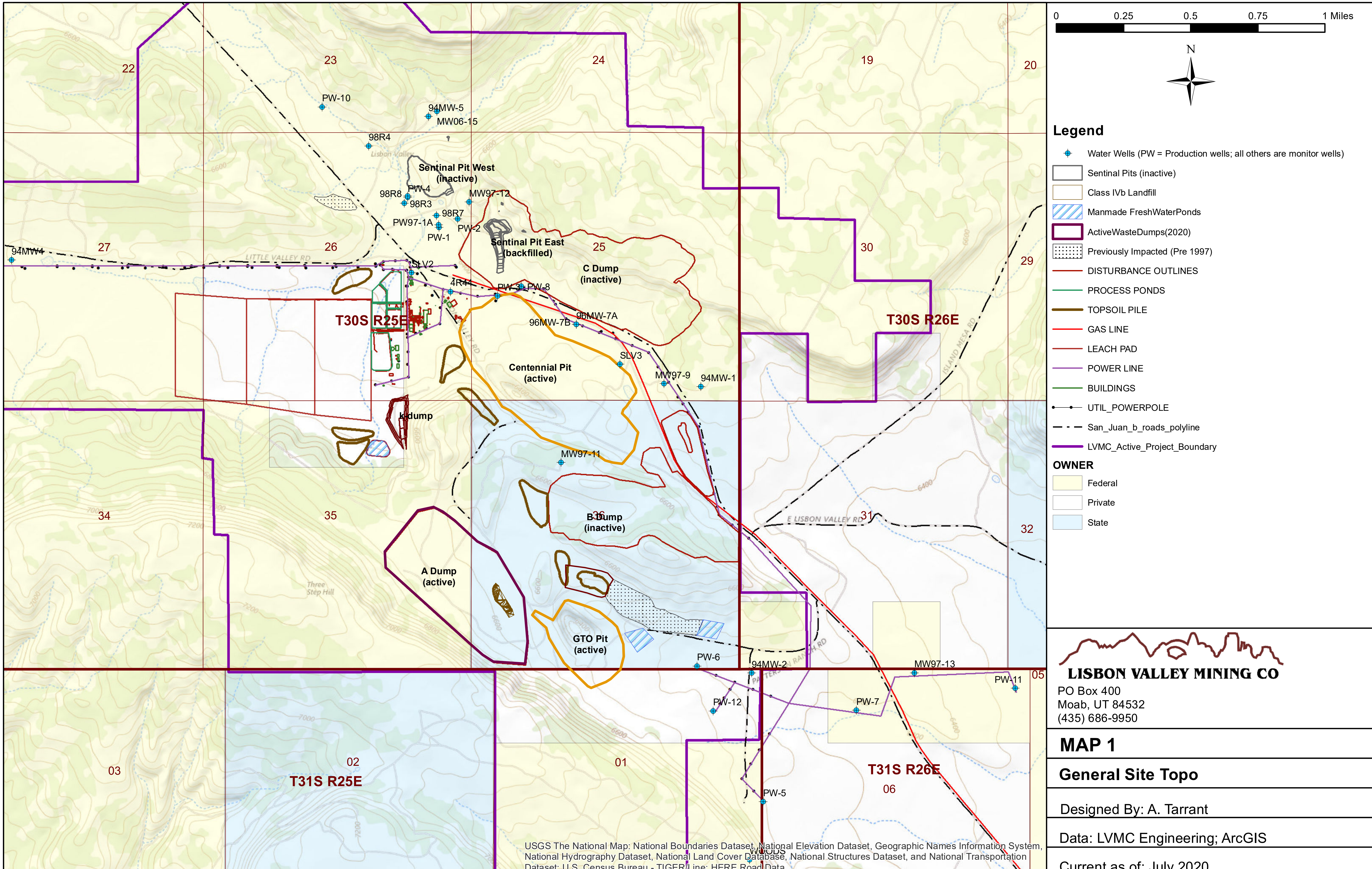
FIGURE 11

Leach Pad Cross Section

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 0.25 0.5 0.75 1 Miles
N
Legend
Water Wells (PW = Production wells; all others are monitor wells)
Sentinal Pits (inactive)
Class IVb Landfill
Manmade FreshWaterPonds
ActiveWasteDumps(2020)
Previously Impacted (Pre 1997)
DISTURBANCE OUTLINES
PROCESS PONDS
TOPSOIL PILE
GAS LINE
LEACH PAD
POWER LINE
BUILDINGS
UTIL_POWERPOLE
San_Juan_b_roads_polyline
LVMC_Active_Project_Boundary
OWNER
Federal
Private
State
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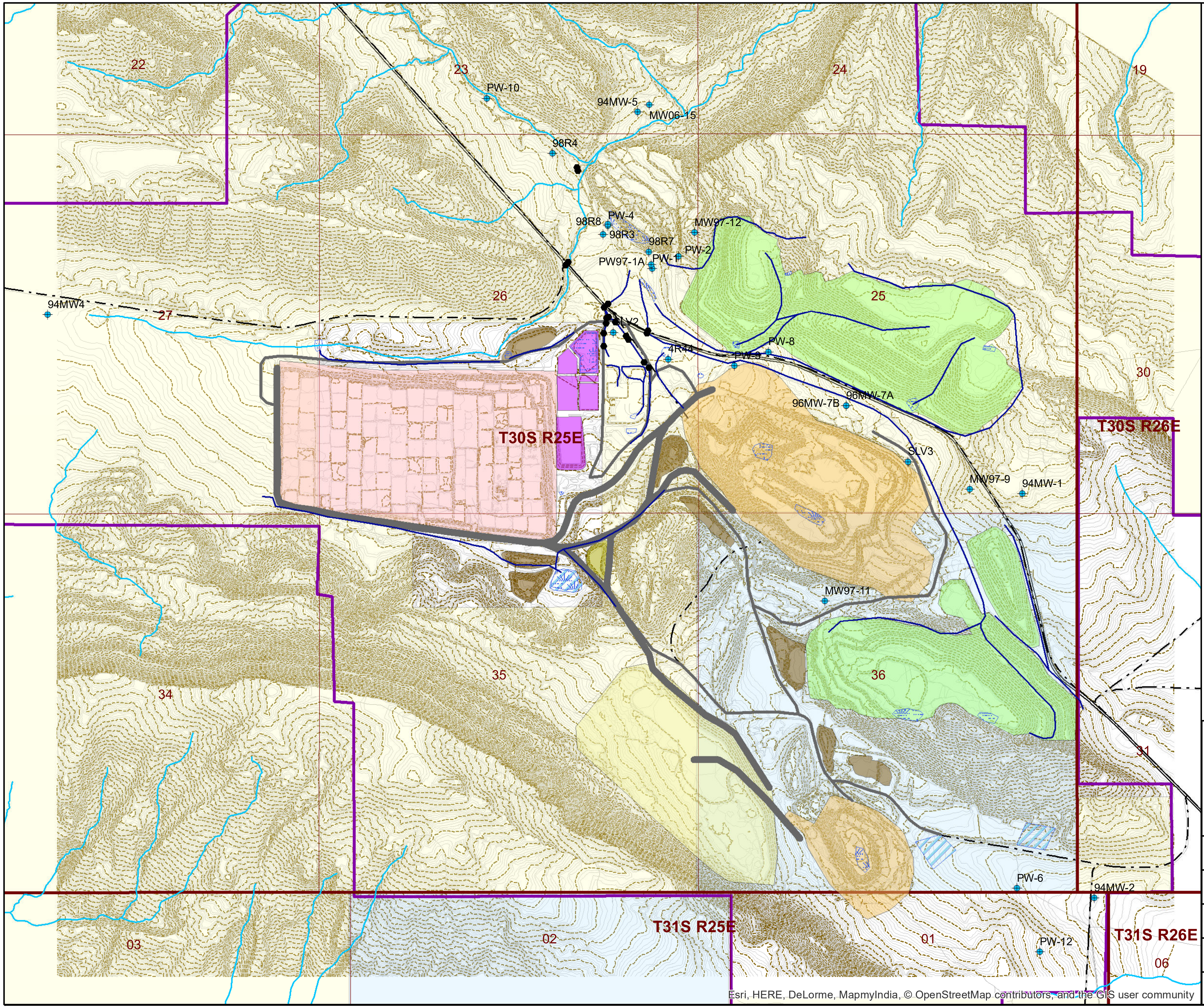
MAP 1
General Site Topo
Designed By: A. Tarrant
Data: LVMC Engineering; ArcGIS
Current as of: July 2020
22
23
24
19
20
27
26
25
30
29
34
35
36
31
32
03
02
01
06
05
T30S R25E
T30S R26E
T31S R25E
T31S R26E
PW-10
94MW-5
MW06-15
98R4
Sentinal Pit West
(inactive)
PW-4
98R8
98R3
MW97-12
98R7
PW97-1A
PW-2
PW-1
Sentinal Pit East
(backfilled)
94MW4
SLV2
C Dump
(inactive)
4R44
PW-3
PW-8
96MW-7B
96MW-7A
SLV3
Centennial Pit
(active)
MW97-9
94MW-1
k dump
MW97-11
B Dump
(inactive)
A Dump
(active)
GTO Pit
(active)
PW-6
94MW-2
MW97-13
PW-11
PW-12
PW-7
PW-5
LITTLE VALLEY RD
E LISBON VALLEY RD
ISLAND MESA RD
Three Step Hill
USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



0 1,000 2,000 3,000 4,000 Feet

N

Legend

- Culverts
- Water Wells
- Ephemeral Drainages (NDH Mapped)
- Major Active Drainages
- Light Vehicle Access Rds
- Haul Rds
- Active Stormwater Control Catchments
- Manmade FreshWaterPonds
- ProcessPonds
- ExistingLeachPad
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- Topsoil
- ClayStockpile
- LVMC_Active_Project_Boundary
- CountyRoads

OWNER

- Federal
- Private
- State

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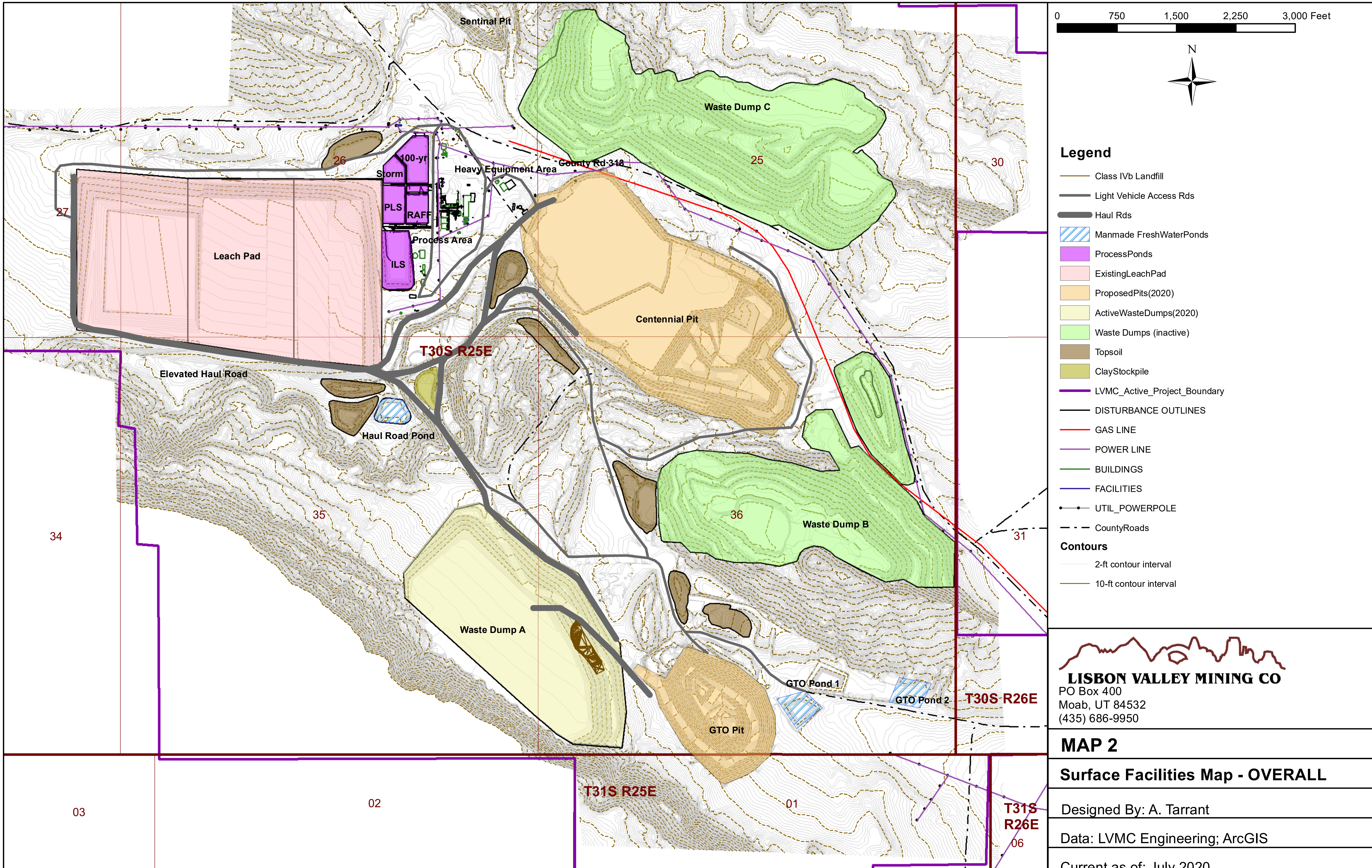
MAP 1a

General Stormwater Flow Features

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



Sentinal Pit
Waste Dump C
25
30
26
100-yr
Storm
Heavy Equipment Area
County Rd 318
27
PLS
RAFF
Process Area
ILS
Leach Pad
Centennial Pit
T30S R25E
Elevated Haul Road
Haul Road Pond
36
Waste Dump B
35
34
31
Waste Dump A
GTO Pond 1
GTO Pond 2
T30S R26E
GTO Pit
T31S R25E
03
02
01
T31S
R26E
06
0
750
1,500
2,250
3,000 Feet
N
Legend
Class IVb Landfill
Light Vehicle Access Rds
Haul Rds
Manmade FreshWaterPonds
ProcessPonds
ExistingLeachPad
ProposedPits(2020)
ActiveWasteDumps(2020)
Waste Dumps (inactive)
Topsoil
ClayStockpile
LVMC_Active_Project_Boundary
DISTURBANCE OUTLINES
GAS LINE
POWER LINE
BUILDINGS
FACILITIES
UTIL_POWERPOLE
CountyRoads
Contours
2-ft contour interval
10-ft contour interval
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MAP 2
Surface Facilities Map - OVERALL
Designed By: A. Tarrant
Data: LVMC Engineering; ArcGIS
Current as of: July 2020

Ref. Number	Hydrocarbons (Y/N)	Tank	Length (FT)
T24	N	Acid cure tank	12' 15'
T25	N	Acid cure tank	12' 15'
T26	N	Acid cure tank	12' 15'
T27	N	Acid cure tank	12' 15'

Ref. Number	Concrete Floor (Y/N)	Building	Length (FT)	Width (FT)	Height (FT)
B25	N	Leach Pad Conex's	20	8	8
B26	N	Blower Conex's	20	8	8

N

0 350 700 1,050 1,400 Feet

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MAP 2e

Surface Facilities Map - Leach Pad

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020

Zoomed in image of B26 Blower located central on the north end of the leach pad.
Also seen is a snapshot of the North Pipe Ditch. This pipe ditch runs the entire extent of the northern edge of the leach pad. All process fluid drains to the northeast, finally reporting to the PLS and ILS ponds via the North Pipe Ditch. See as-builts of the leach pad in Appendix N.

N

0 25 50 75 100 Feet

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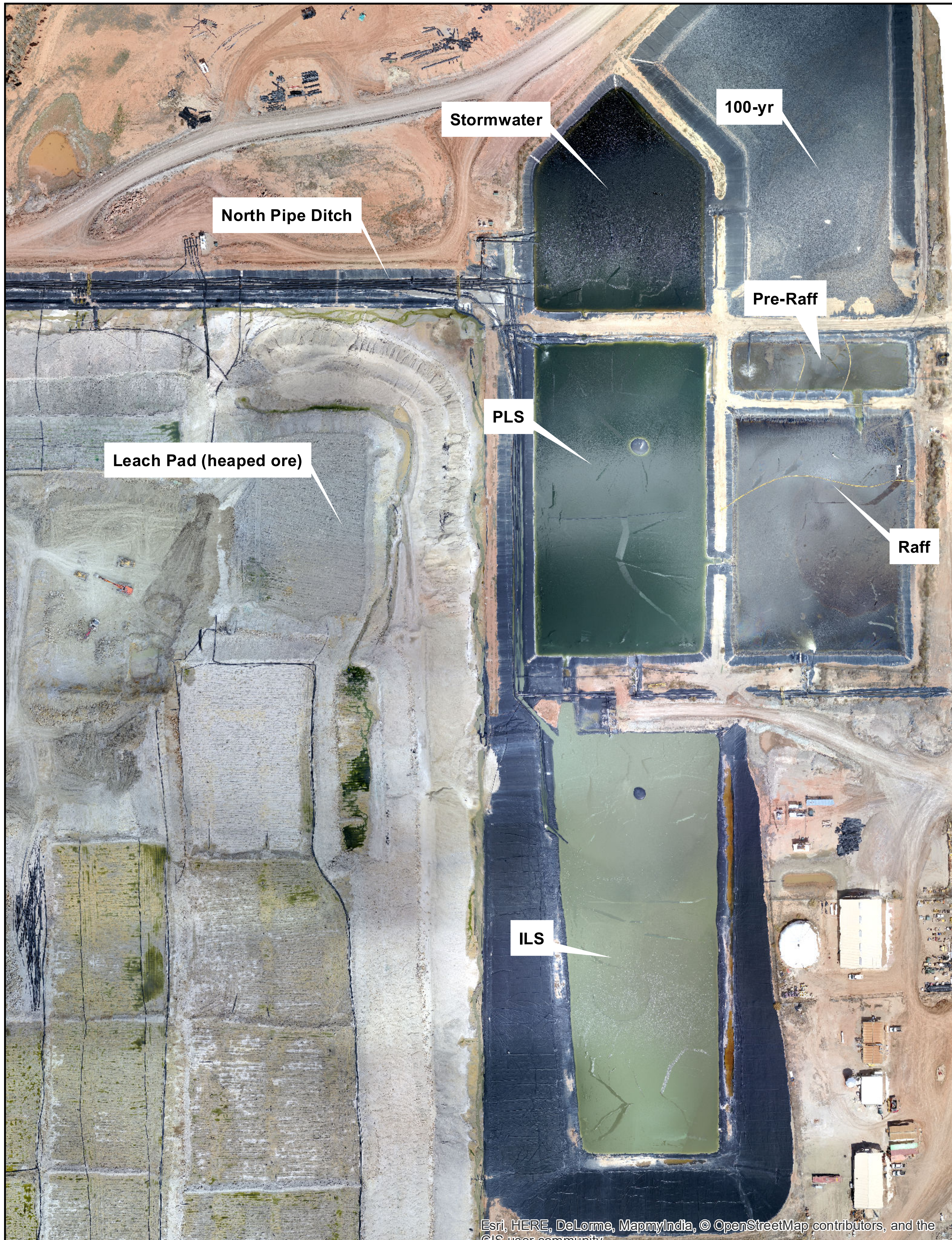
MAP 2f

Surface Facilities Map - Pad Features

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



PLS, ILS, Raff, Pre-Raff, and Stormwater Ponds are all double-lined with leak detection sumps.

100-yr pond is single-lined pond for emergency stormwater overflow storage during 100-yr 24-hr storm event (see BAT Plan)

ILS Pond: leak detection sump located in northeast corner. Overflows via weir into PLS Pond.

PLS Pond: leak detection sump located in northeast corner. Overflows via weir into Stormwater Pond.

Raff & Pre-Raff Pond: leak detection sump located in northeast corner. Overflows via weir into PLS Pond.

Stormwater Pond: No leak detection sump. This pond remains dry unless during major storm events and preventative maintenance on other process ponds.

100-yr Pond: No leak detection sump. This pond remains dry unless during 100-year 24-hour storm events (or larger or more frequent)

See As-builts of ponds and pad in Appendix N.

N

0 150 300 450 600 Feet

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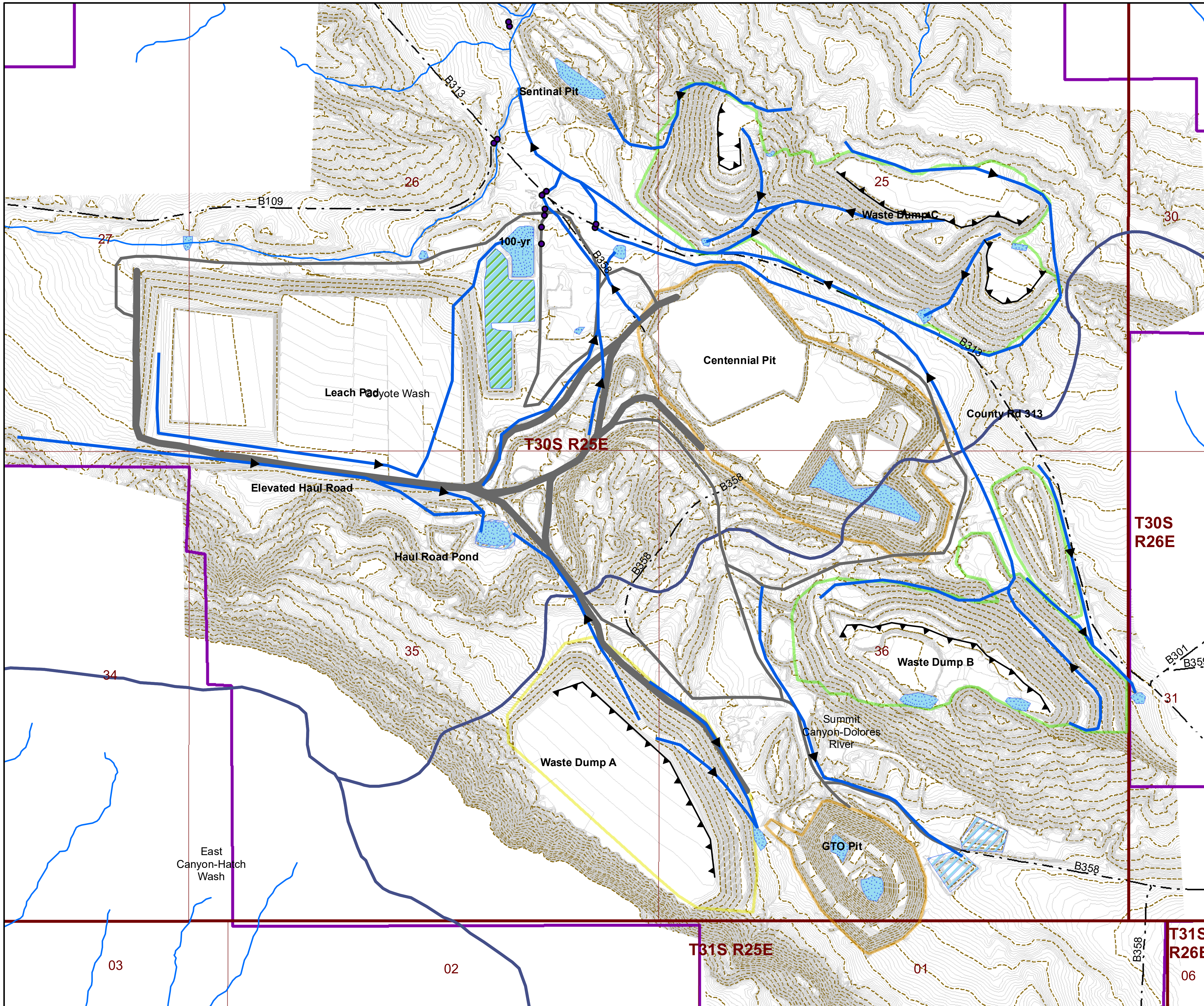
MAP 2g

Surface Facilities Map - Process Ponds

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



0 750 1,500 2,250 3,000 Feet

N

Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:

1 - sloping of all waste dump tops so that storm water naturally ponds or drains away from the largest contiguous slopes;

2 - sloping of all waste dump slopes to 2.5H:1V or shallower, with breaks in long slopes to ensure terminal velocity of stormwater runoff is reduced;

3 - sloping the leach pad so that it outward-draining to a riprapped channel that runs to the northeast corner of the leach pad, and then drains toward the 100-yr storm pond.

4 - berming of all entire pit perimeters and ensuring stormwater runoff drains away from pit slopes.

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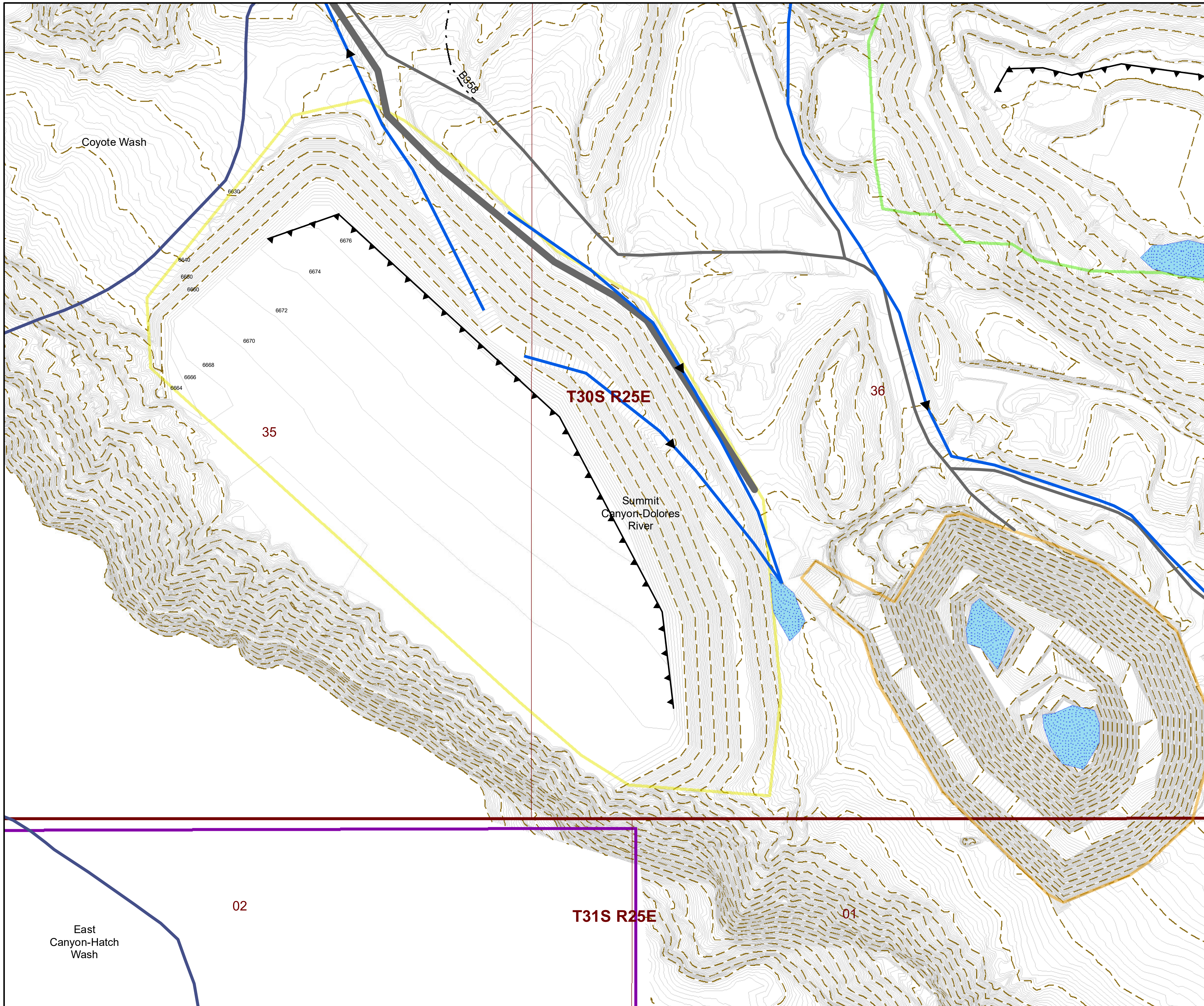
MAP 4

Post Reclamation Hydrology - OVERALL

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 300 600 900 1,200 Feet

N

Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- Retention_Ponds
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:
1 - Sloping the waste dump top to drain toward the center and intercept the designated drainage channels;
2 - Break up the slope of the waste dump with catchment areas in order to reduce the velocity of runoff.

Elevation will decrease from 6676 to 6630 (46 feet vertical drop) over a length of approximately 300-500 feet. This drop will be segmented by drainages as seen on the map.

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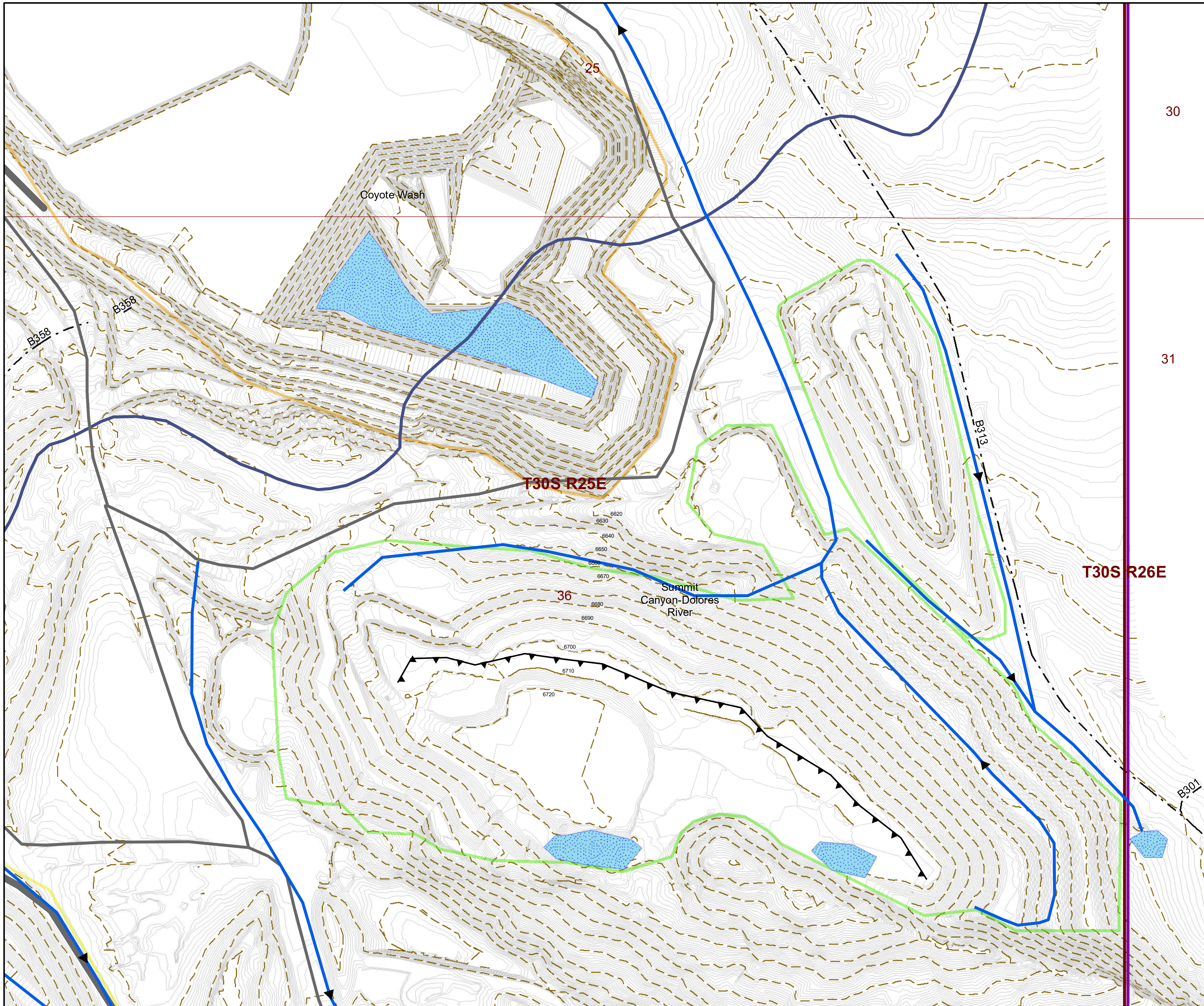
MAP 4a

Post Reclamation Hydrology - A Dump

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



0 300 600 900 1,200 Feet

N

Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- Retention_Ponds
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:
1 - Sloping the waste dump top to drain toward the south;
2 - Install retention basins as seen on the map for the capture of storm water runoff for evaporation or infiltration;
3 - Break up the slope of the waste dump with catchment areas in order to reduce the velocity of runoff.
4 - installing berms around all pit perimeters to ensure water drains away from pit slopes.

Elevation will decrease from 6720 to 6590 (130 feet vertical drop) over a length of approximately 600-700 feet. This drop will be segmented by drainages as seen on the map.

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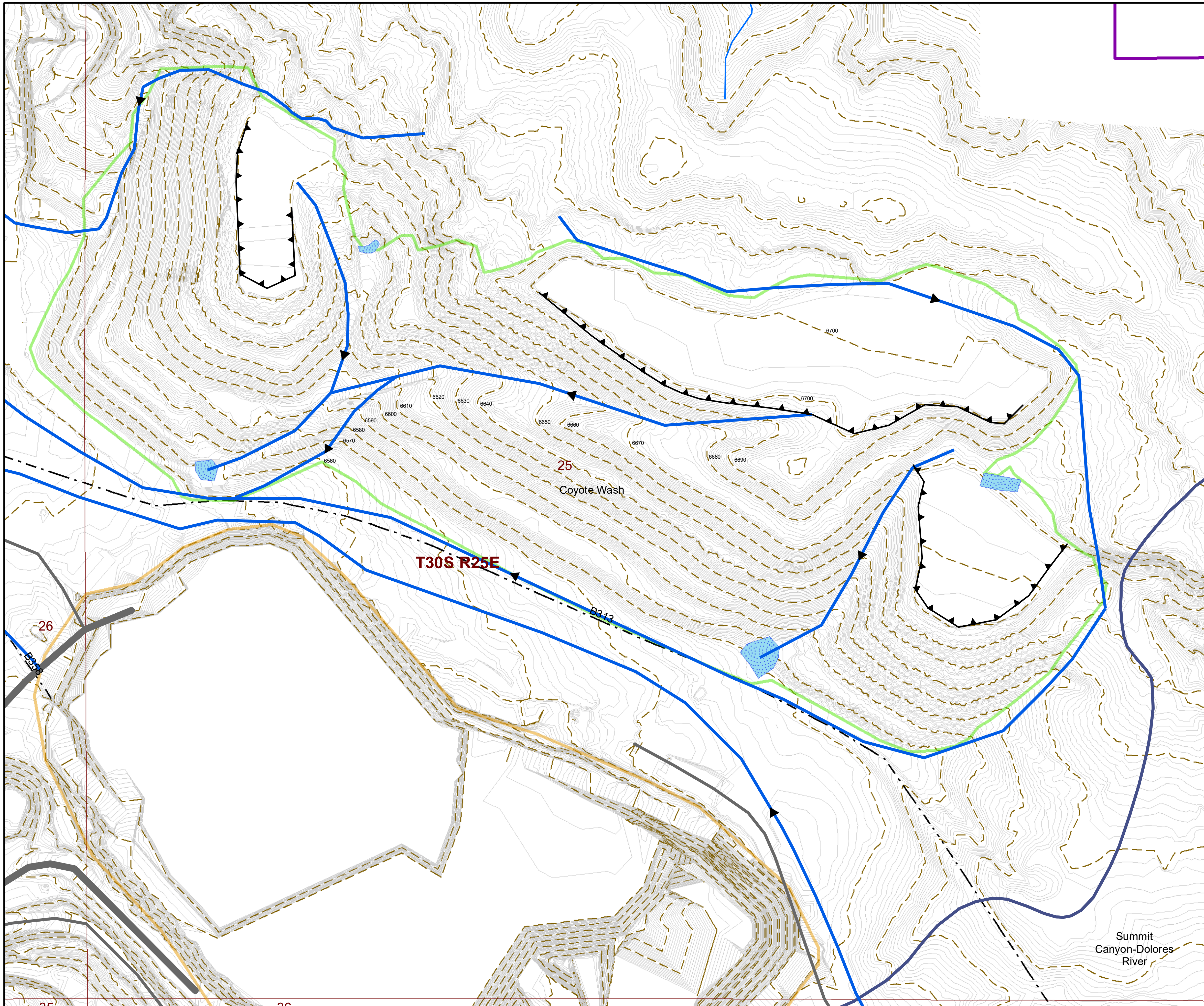
MAP 4b

Post Reclamation Hydrology - B Dump

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- Retention_Ponds
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:
1 - installing riprapped drainage channels along the northeast side of the waste dump to divert storm water around the perimeter of the C dump instead of flowing on and down the front slopes.
2 - Installing fortified riprapped drainage channels around the perimeter and areas of heavy drainage interception as seen on the map.

Elevation will decrease from 6700 to 6560 (140 feet vertical drop) over a length of approximately 1,200 feet. This drop will be segmented by drainages as seen on the map.

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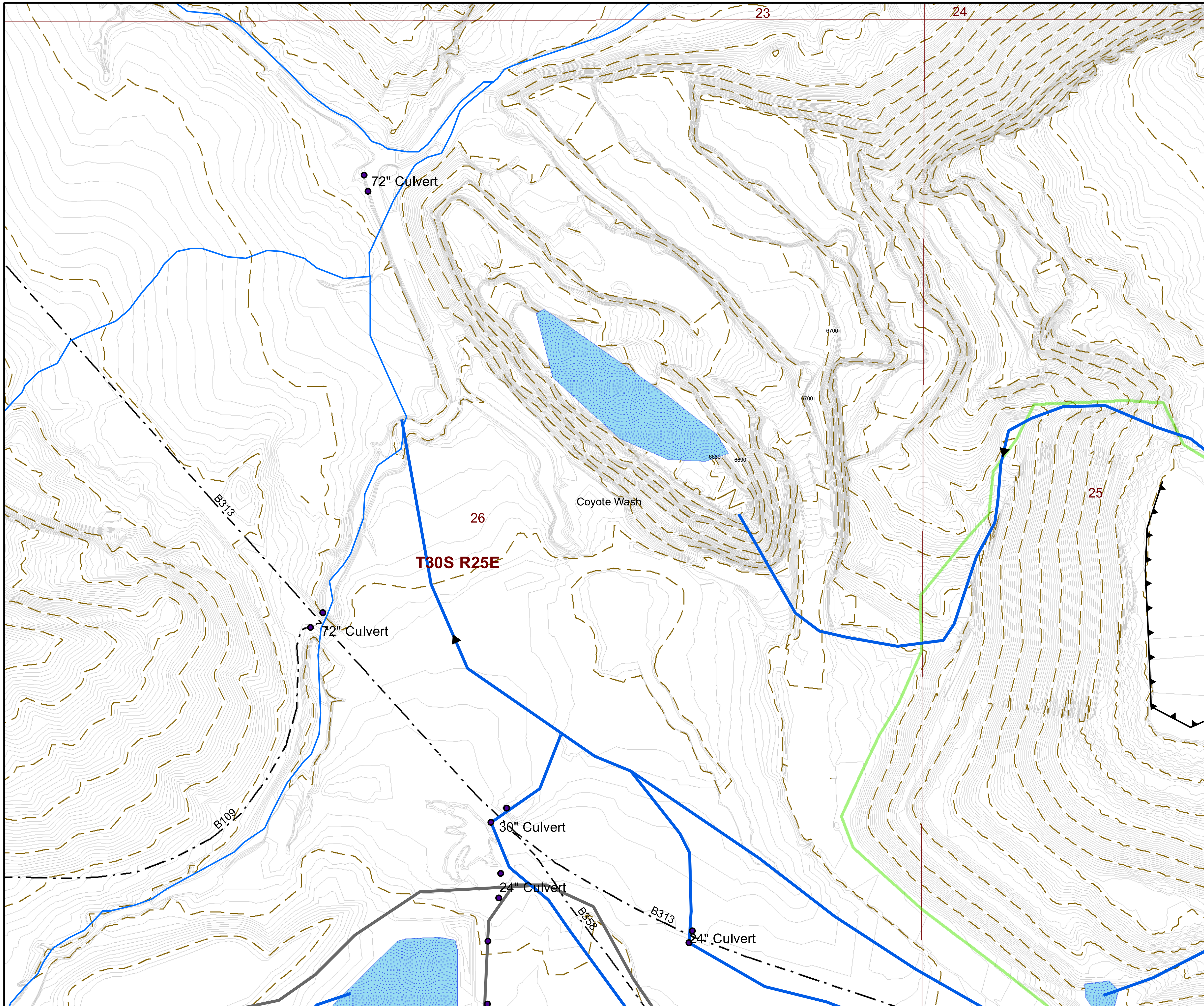
MAP 4c

Post Reclamation Hydrology - C Dump

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



0 200 400 600 800 Feet

N

Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- Retention_Ponds
- ProposedPits(2020)
- ActiveWasteDumps(2020)
- Waste Dumps (inactive)
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:
Engineering and construction of riprapped drainage connecting the primary drainage off the toe of the C dump to the large drainage channel that connects with the existing natural Little Valley ephemeral drainage.

The riprapped drainage will be designed to ensure it is capable of transporting runoff during a 100-year 24-hour storm event from the C dump drainage as well as intercepting waters from the three culverts (72", 30", 24") currently installed and existing underlying the Lisbon Valley Highway.

The drainage will be constructed southward from the edge of the inactive Sentinel Pit as seen on the map. The purpose for this is to ensure ponding does not occur near the pit slope which could cause saturation and potential pit wall failure.

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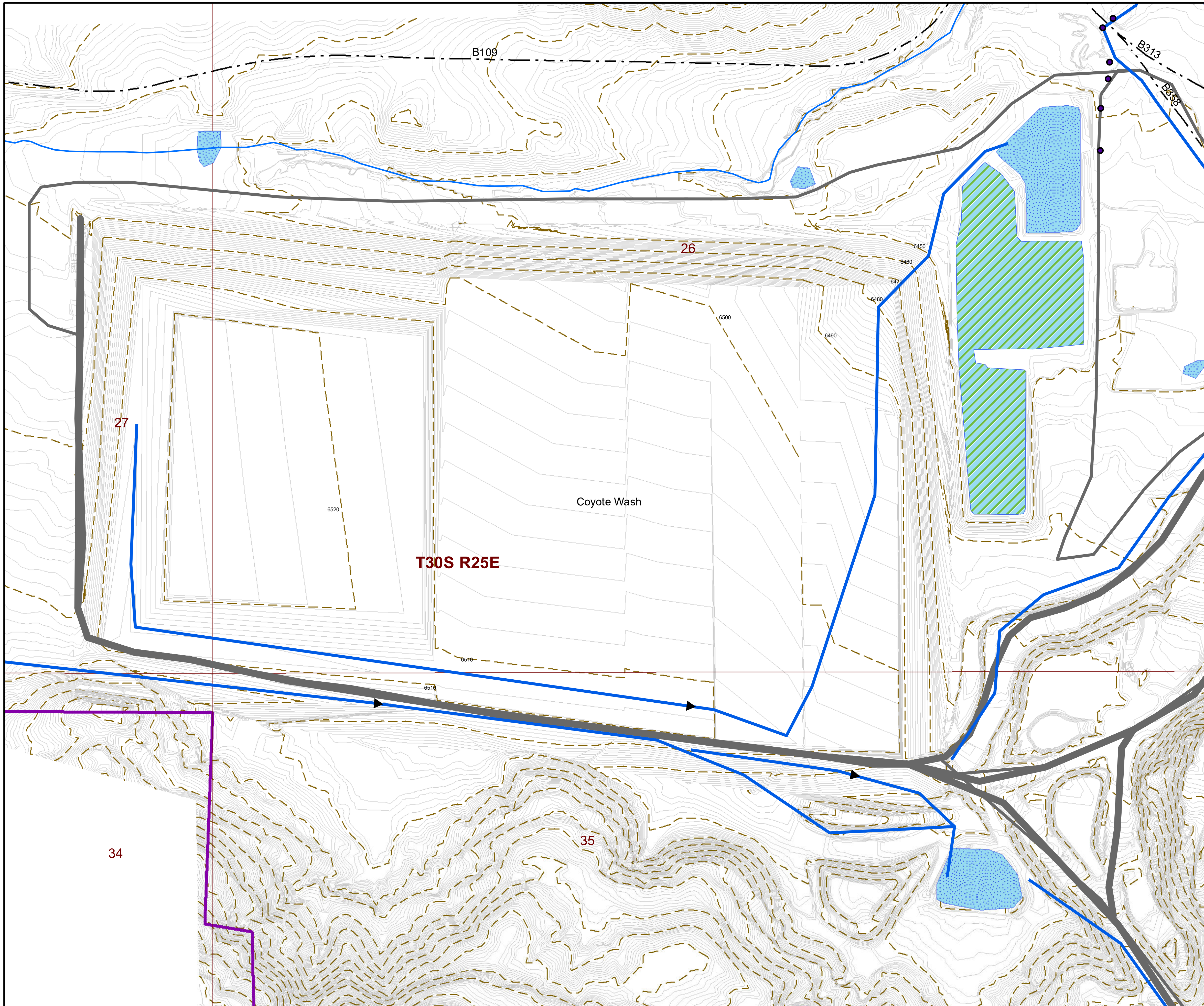
MAP 4d

Post Reclamation Hydrology - Sentinal

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



0 300 600 900 1,200 Feet

N

Legend

- Post-mining_culverts
- Directional Re-grade (1% or greater)
- Natural Ephemeral Drainages (NHD Mapped)
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- LVMC_Active_Project_Boundary
- CountyRoads

Post-mining Contour

- 2-ft contour
- 10-ft contour

Post reclamation hydrology will include:
1 - Grading of the leach pad so that surface water drains toward the most gradual slope, with final drainage in the northeast corner, reporting to the 100-yr pond.
2 - With the grading plan, water will report outward, not inward. This will reduce the amount of potential infiltration inward.

Elevation will decrease from 6526 to 6450 (76 feet maximum vertical drop) over a very gradual length. The northeast corner of the pad will be riprapped to ensure stability during flow as that will be the primary flow path for all surface water draining from the top of the leach pad.

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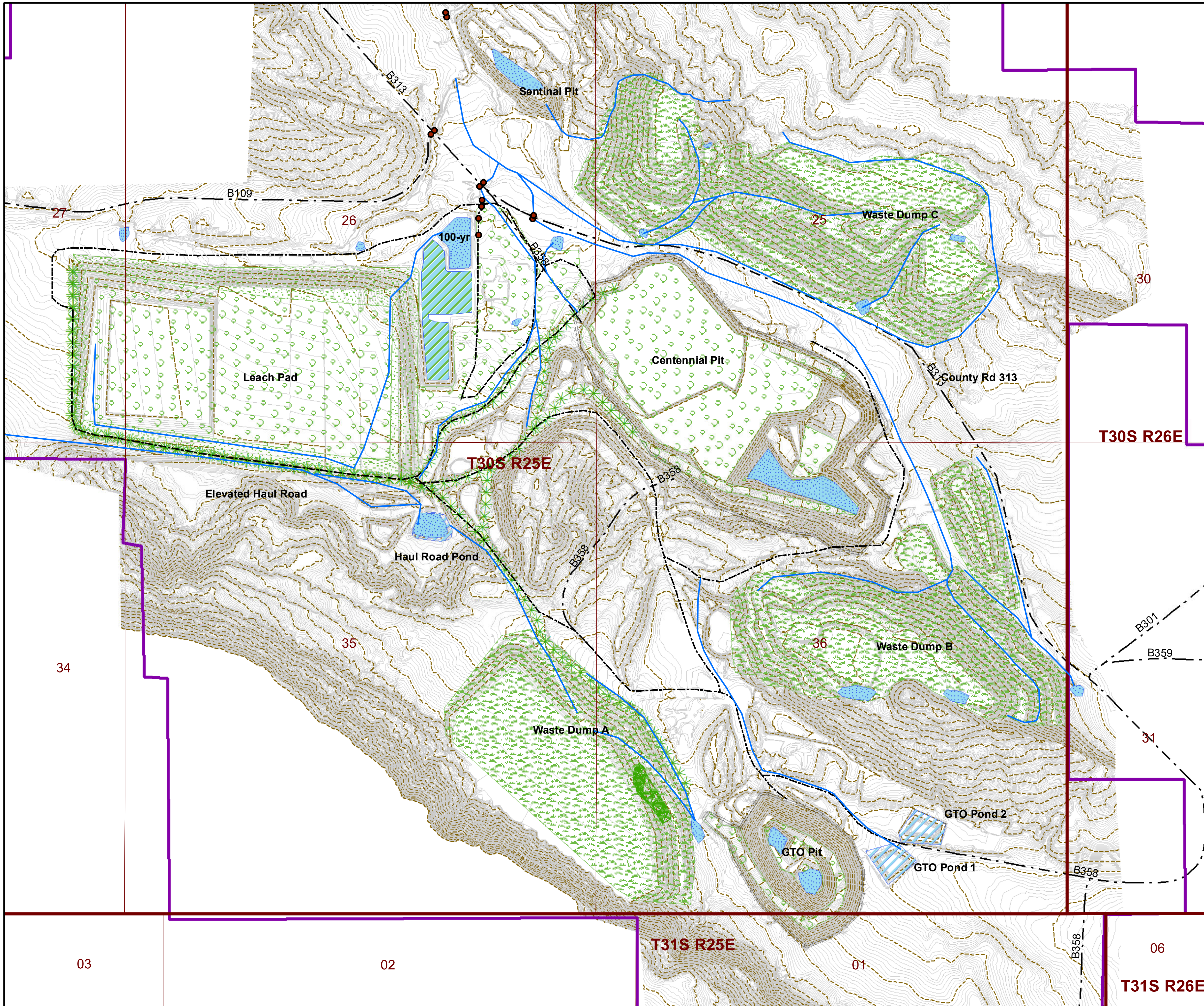
MAP 4e

Post Reclamation Hydrology - Leach Pad

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: August 2020



0 750 1,500 2,250 3,000 Feet

N

Legend

- Post-mining_culverts
- Post-Mining Drainage_Patterns
- Light Vehicle Access Rds (reclaimed to 14' width)
- ET-Cells
- Post-mining retention ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Haul Rds (reclaimed)
- Class IVb Landfill
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation plan for the Lisbon Valley Copper Mine will follow the plan as set forth in the NOI text.
General site-wide guidelines will include:
1 - Mine Haul Roads will be reclaimed completely.
2 - Light vehicle access roads will be reclaimed to a standard width of 14-feet to allow for continued site access post-mining.
3 - All pit perimeters will be bermed and fenced.
4 - All slopes steeper than 2.5H1V will be re-graded to a slope of at least 2.5H1V.
5 - Waste dump slopes and tops will be re-graded to ensure drainage is contained and diverted to the appropriate drainage channels or retention ponds.
6 - Monitor and production wells will be plugged and abandoned after post-closure monitoring has ceased.
7 - The Leach Pad and ponds will be reclaimed per Appendix I.
8 - All fresh water ponds will remain post-mining.
9 - All reclaimed surfaces (excluding haul roads and pit floors) will have topsoil applied to a thickness of 1' followed by seeding using the Division and BLM designated seed mix.
10 - Any remaining stockpile areas will be pushed prior to re-topsoiling and re-seeding.

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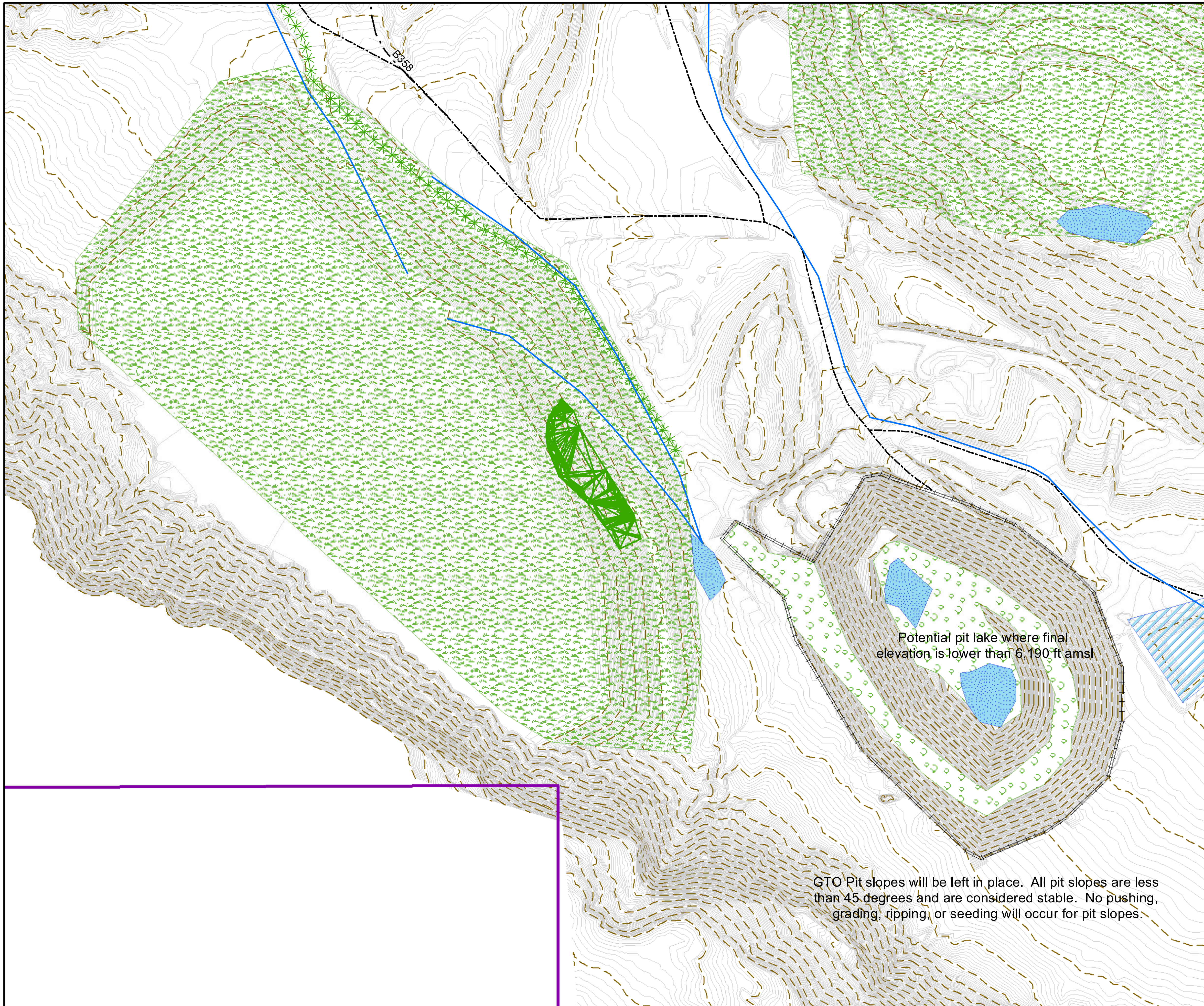
MAP 5

Reclamation Plan - OVERALL

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 300 600 900 1,200 Feet

N

Legend

- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Post-mining retention ponds
- FreshWater Ponds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation plan for the Waste Dump A will include:
1 - Capping the landfill with at least 24" of inert waste from Waste Dump A (per DEQ requirements).
2 - Re-contouring Dump top and slopes (including area of buried landfill) to ensure storm water is diverted to the designated drainage channels.
3 - Placement of 12" of topsoil on dump top and slopes. Topsoil will be placed and gently ripped by the dozer along contour to create seed beds.
4 - Seeding will be performed in late fall, as weather permits, and will be done either by aerial methods, broadcast methods, or other methods as approved by the Division and proven to be most successful for this environment.

Reclamation of GTO Pit will include:
1 - Ripping of haul roads and pit floors.
2 - Placement of 12" of topsoil on ripped roads and pit floors (only if adequate topsoil exists).
3 - Seeding of topsoiled areas in late fall.
4 - Installing perimeter fencing and berms along the perimeter of the GTO pit. This includes blocking all access along the haul road.

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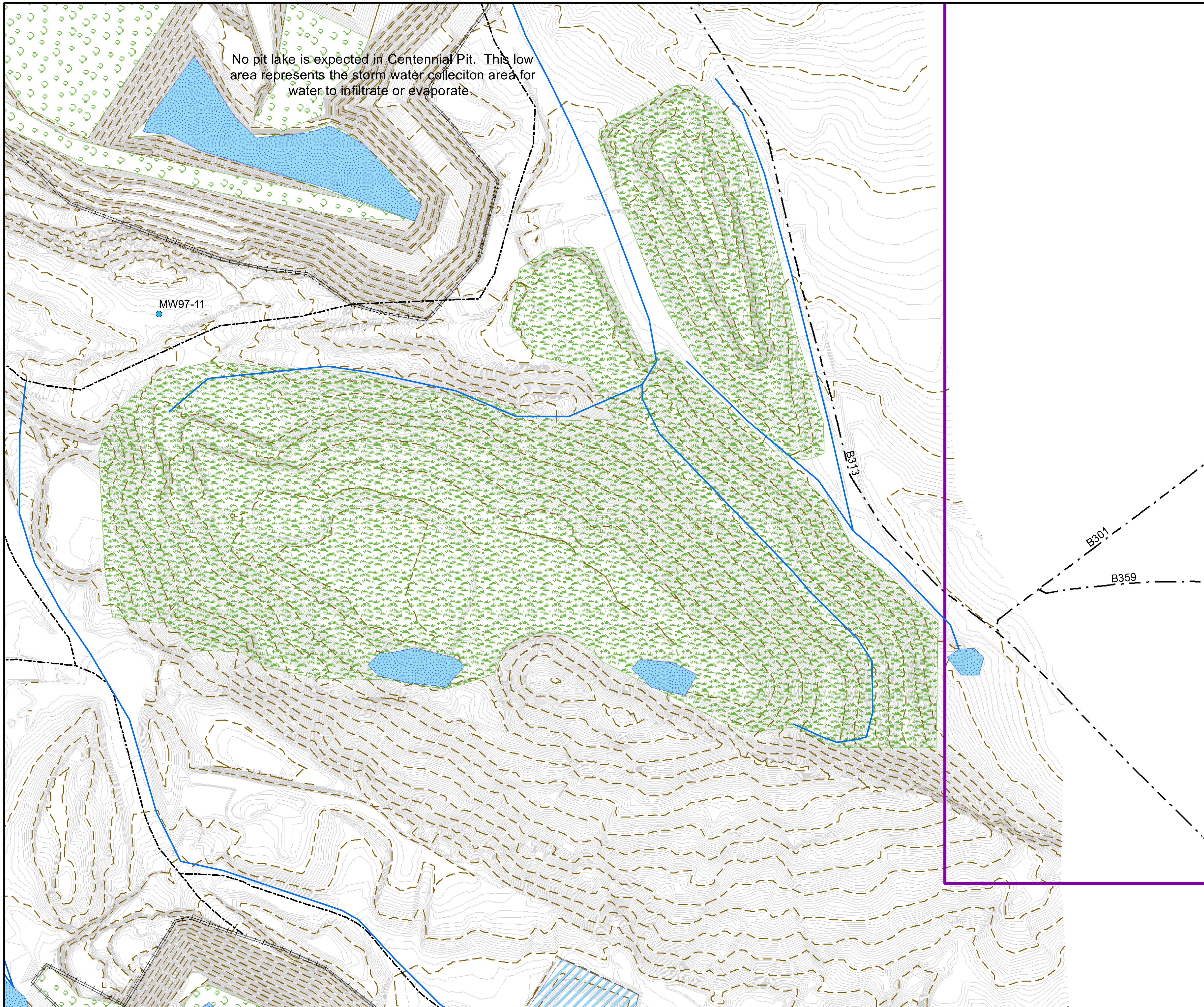
MAP 5a

Reclamation - Waste Dump A & GTO Pit

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



Legend

- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation plan for the Waste Dump B will include:
1 - Re-contouring Dump top and slopes to ensure storm water is diverted to the designated drainage channels and/or catchment sumps.
2 - Placement of 12" of topsoil on dump top and slopes. Topsoil will be placed and gently ripped by the dozer along contour to create seed beds.
3 - Seeding will be performed in late fall, as weather permits, and will be done either by aerial methods, broadcast methods, or other methods as approved by the Division and proven to be most successful for this environment.

*Note: during re-contouring of dump slopes, catchment breaks will be installed for storm water diversion and to prevent runoff from causing excessive rilling. The diversion channel shown here is illustrative only. Field surveys will confirm the optimum location for the installation of the catchment breaks.

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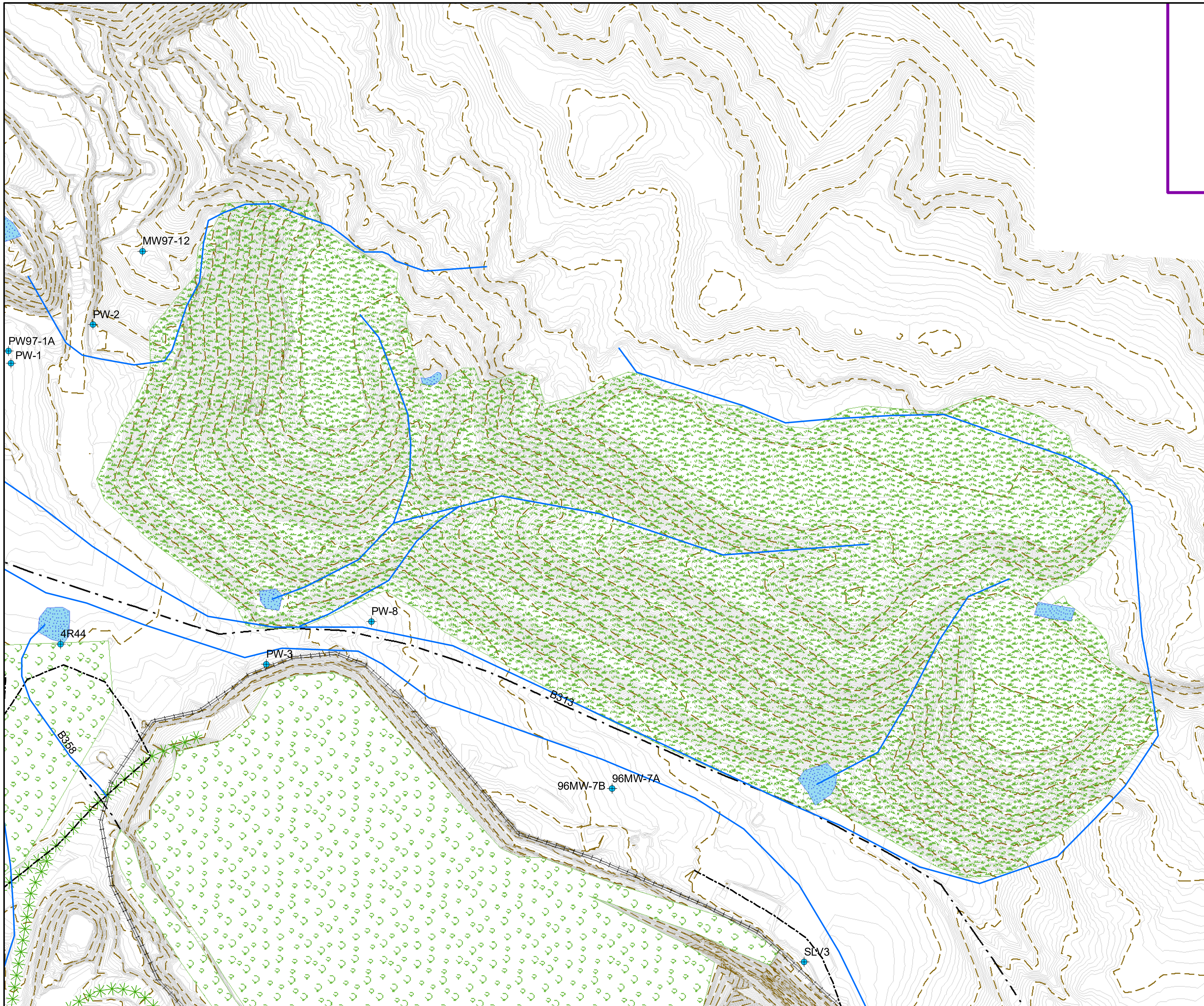
MAP 5b

Reclamation - Waste Dump B

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 300 600 900 1,200 Feet

N

Legend

- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation plan for the Waste Dump C will include:
1 - Pushing the slopes that are greater than 2.5H:1V.
2 - Installing a riprapped drainage channel along the perimeter of the waste dump that will ultimately drain to the Sentinal Pit.
3 - Installing catchment sumps at the toe of major drainage channels.
3 - Re-contouring those areas of minimal vegetative success.
4 - Topsoil placement along those areas of recent re-contouring.
5 - Re-seeding the entire waste dump surface by aerial seeding methods.

*Note: As with all reclamation efforts, seeding will be performed in the late fall as weather permits.

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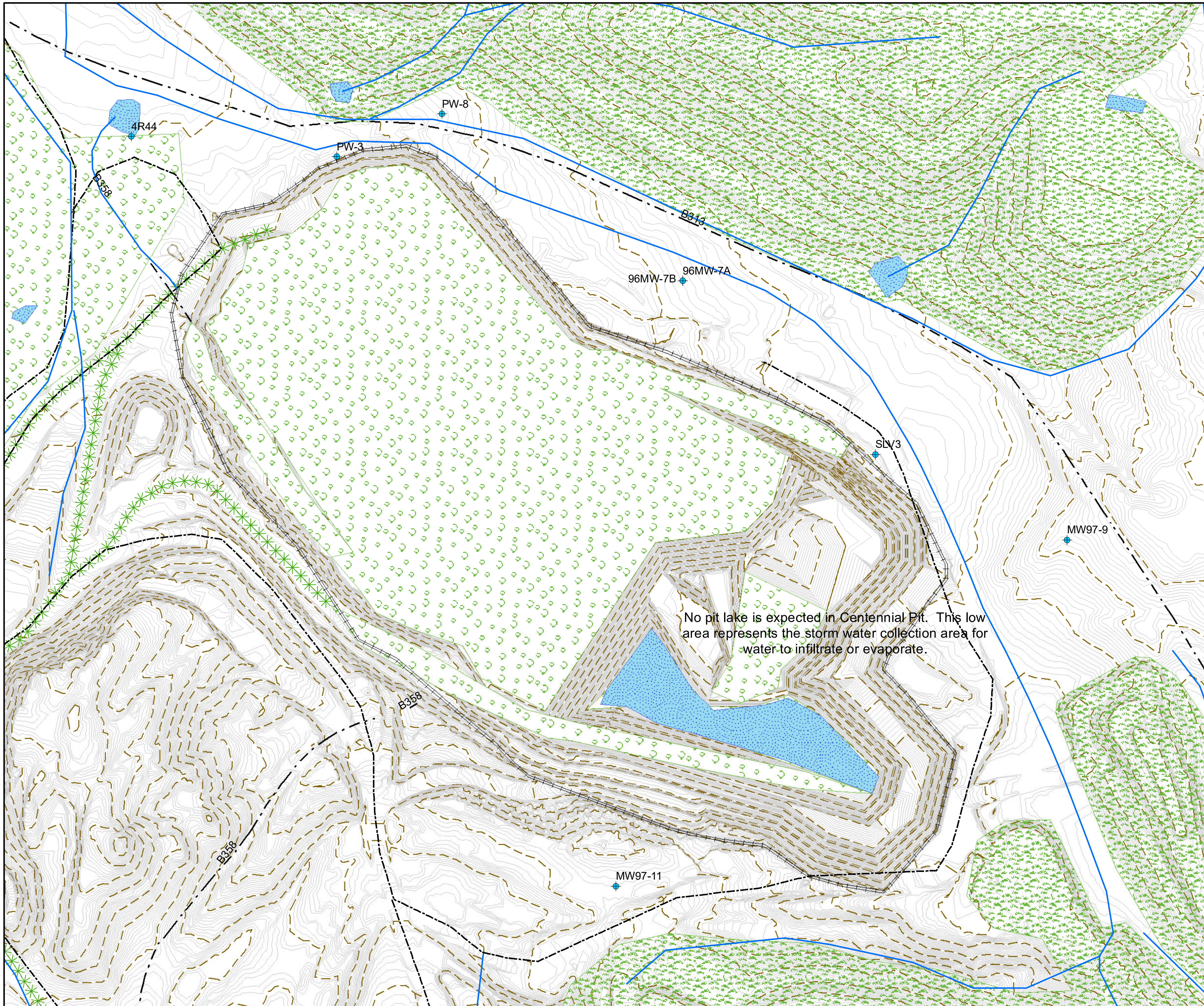
MAP 5c

Reclamation - Waste Dump C

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 300 600 900 1,200 Feet

N

Legend

- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation of the Centennial Pit will include:
1 - Backfilling of any void space that is lower than 6,200' amsl (void space estimated at end of mine to be 275K tons).
2 - Ripping of haul roads and pit floors.
3 - Placement of 12" of topsoil on ripped roads and pit floors (if adequate topsoil exists).
4 - Seeding of topsoiled areas in late fall.
5 - Installing perimeter fencing and berms along the perimeter of the Centennial pit. This includes blocking all access along the haul road.

Centennial Pit slopes will be left in place. All pit slopes are less than 45 degrees and are considered stable. No pushing, grading, ripping, or seeding will occur for pit slopes.

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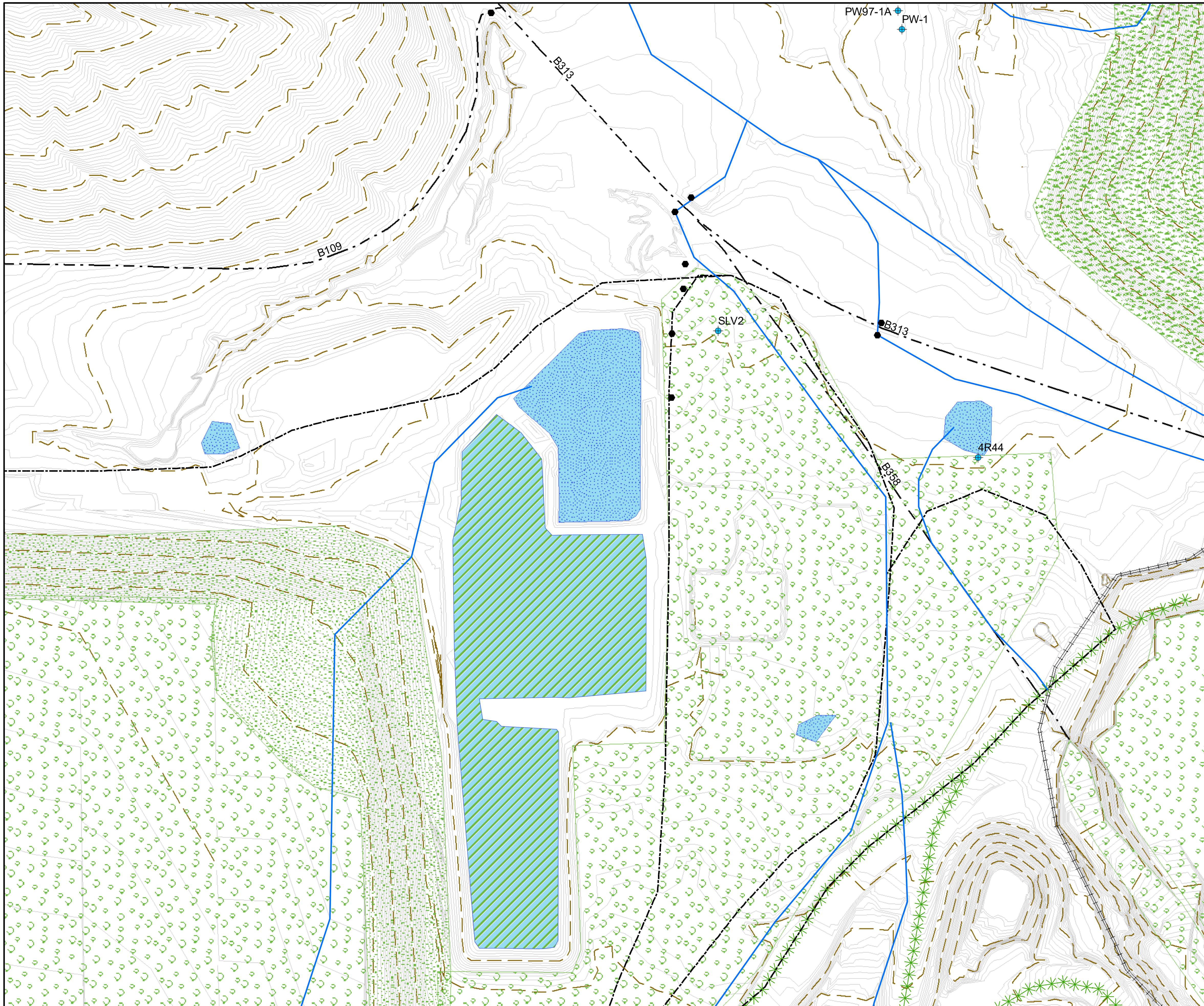
MAP 5d

Reclamation - Centennial Pit

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 200 400 600 800 Feet

N

Legend

- Post-mining_culverts
- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation of the Process Area will include:
1 - Isolating all process facilities and draining the fluids either to the process ponds for recirculation or to isolation tanks in preparation of removal by certified vacuum trucks.
2 - Removal of all structures. This will be performed by demolishing the structures on site and removing them to the Class IVb landfill prior to its closure (see Map 5a).
3 - Removal of all mobile equipment from site or to a designated long-term storage area, where they will be drained of all fluids.
4 - Breaking up of all concrete foundations and footings.
5 - Burying existing concrete foundations and footings with inert waste.
6 - Flat surfaces will be ripped and the entire area will be re-contoured to encourage habitat formation.
7 - The entire process surface area will be covered with 12" of topsoil, followed by seeding in the late fall.
8 - See Appendix I for conversion of the process ponds to ET cells, and for long-term draindown plan for the leach pad.
9 - Excess liner on ILS pond will be folded inward and slopes reclaimed.

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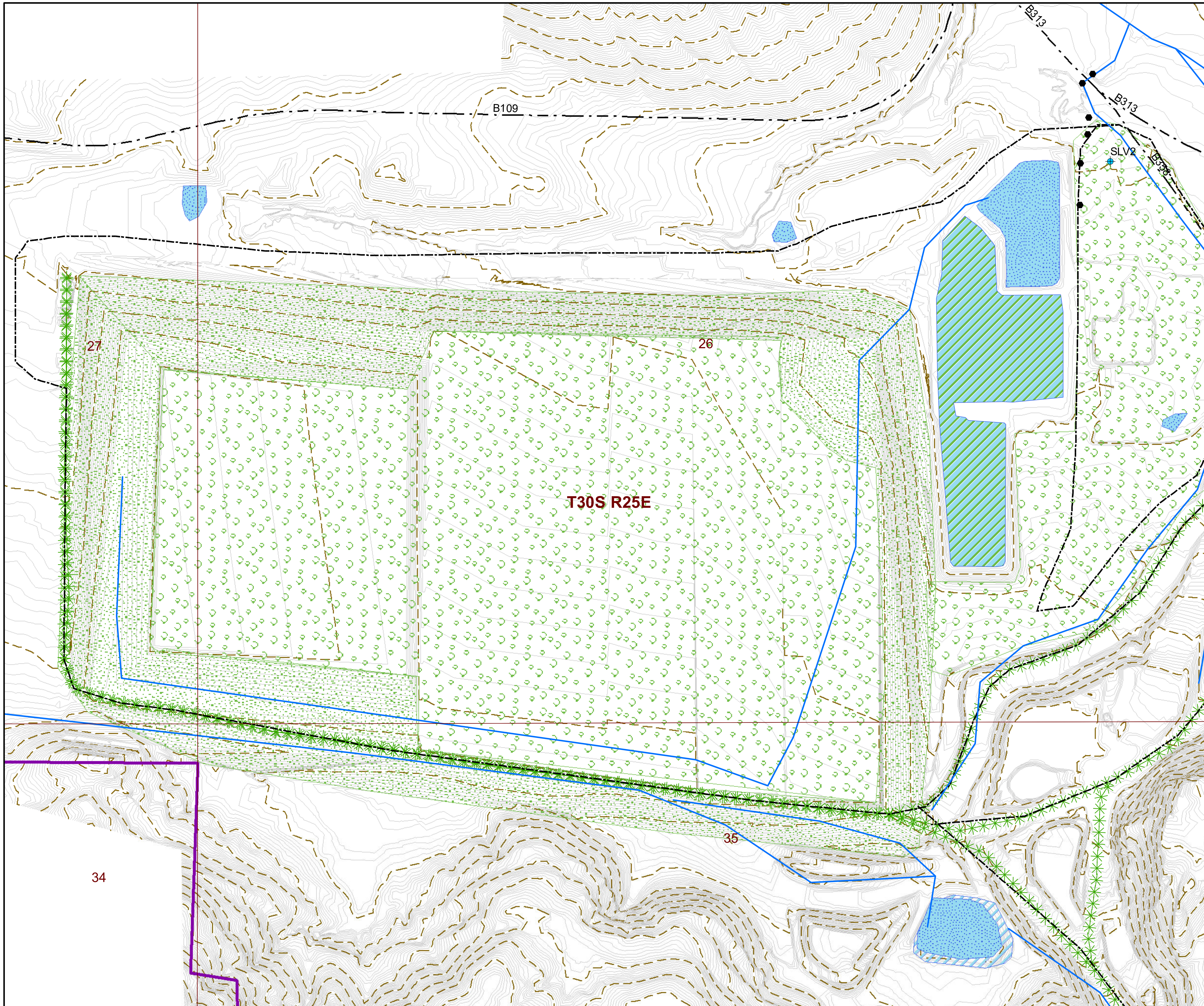
MAP 5e

Reclamation - Process Area

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 300 600 900 1,200 Feet

N

Legend

- Post-mining_culverts
- Monitor_Wells
- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- LVMC_Active_Project_Boundary
- CountyRoads

Reclamation of the Leach Pad will follow the plan as set forth in Appendix I. A brief summary includes:
1 - Draindown of solution.
2 - Conversion of Process ponds to ET cells.
3 - Re-contouring leach pad slopes to a maximum of 2.5H:1V.
4 - Re-contouring leach pad top to drain toward the designated drainage channels.
5 - Placement of 3' of inert waste or a mixture of waste and alluvium (most of which will be stored in the elevated haul road to the south) on the leach pad surface.
6 - Ripping of associated haul roads and reclaiming down to a 14' access road for post-mining use.
7 - Placement of 12" of topsoil on leach pad surface.
8 - Re-seeding of entire leach pad and reclaimed roads in late fall.

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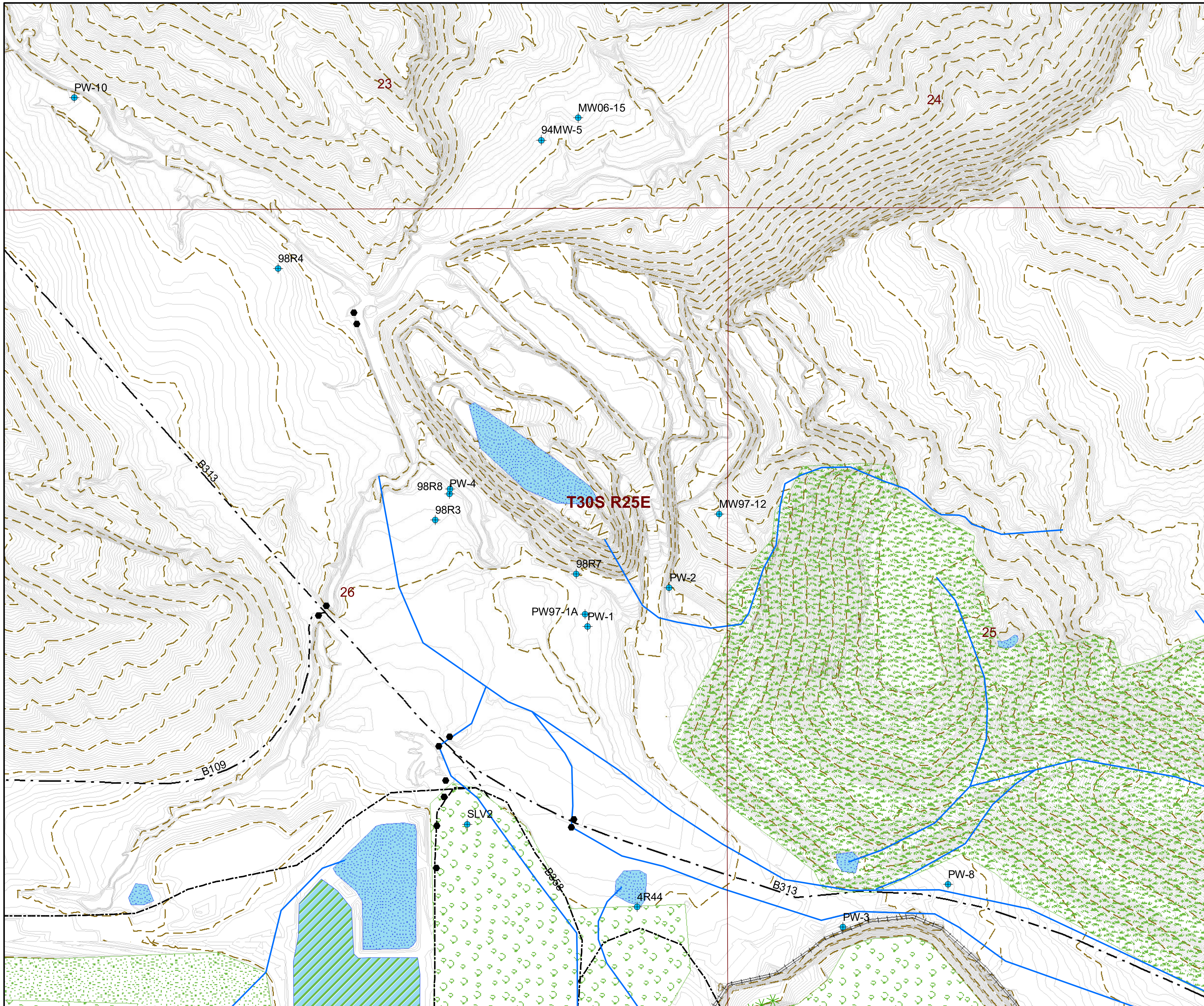
MAP 5f

Reclamation - Leach Pad

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



Reclamation of the Sentinal Pit will include:

1 - Ripping of haul roads and pit floors.
2 - Placement of 12" of topsoil on ripped roads and pit floors (if sufficient topsoil exists).
3 - Seeding of topsoiled areas in late fall.
4 - Installing perimeter fencing and berms along the perimeter of the Sentinal pit. This includes blocking all access along the haul road.

Installation of Post-mining drainage:

1 - Connect all drainage channels from C dump and the three culverts running underneath the Lisbon Valley Highway via primary drainage that will feed into the Little Valley natural ephemeral drainage. Upgrades to culverts will be performed if deemed necessary based upon 100-year 24-hour storm event calculations. The Company assumes the culverts meet this event standard, but further modeling will be performed.

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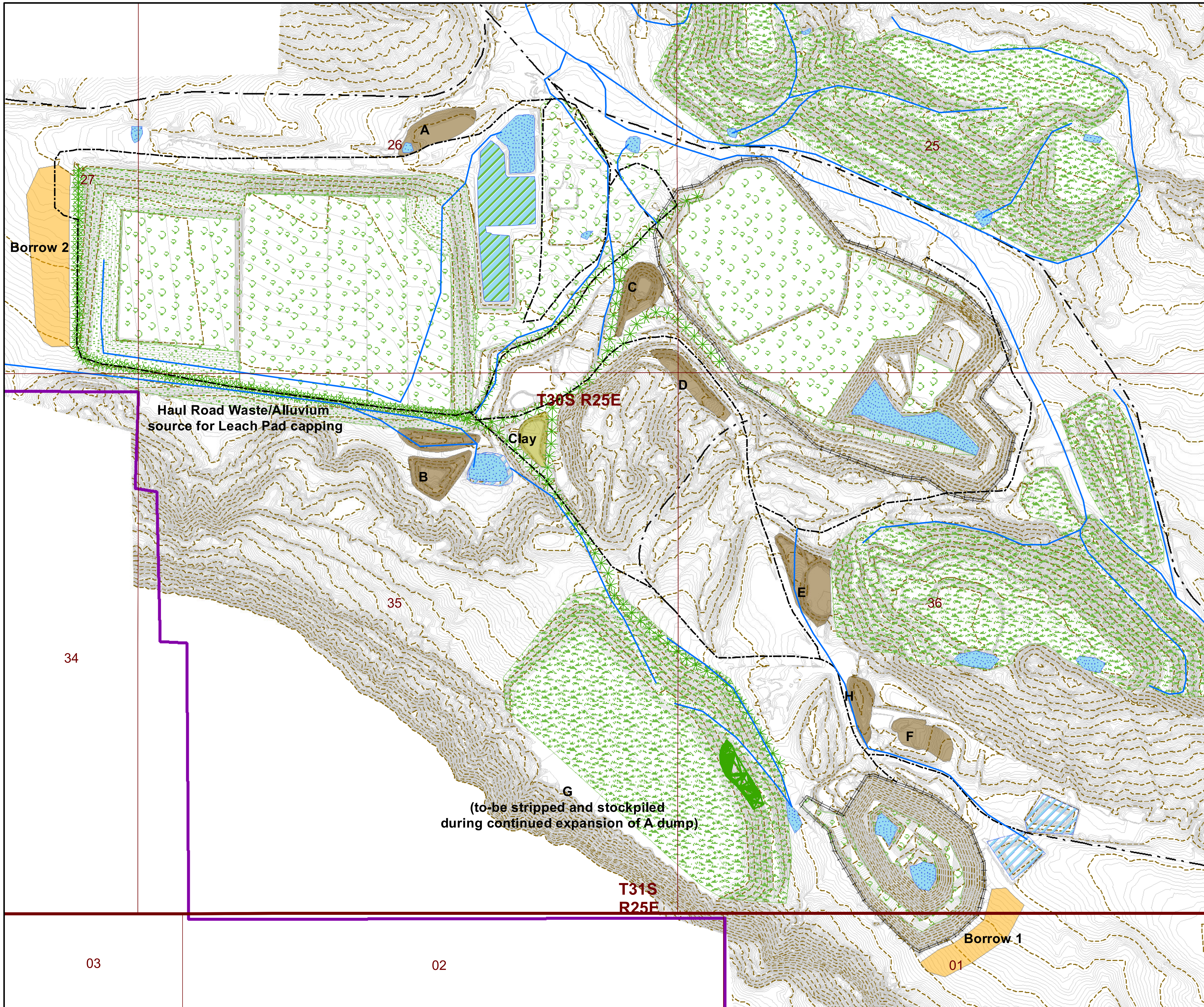
MAP 5g

Reclamation - Sentinel Pit

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020



0 750 1,500 2,250 3,000 Feet

N

Legend

- Drainage_Patterns
- Light Vehicle Access Rds (reclaimed)
- Haul Rds (reclaimed)
- ET-Cells
- Retention_Ponds
- FreshWaterPonds (backfilled to small sumps)
- Pit Berm & Fencing
- Reclaimed Heap Slopes
- Reclaimed Surfaces
- Reclaimed Waste Dump
- Reclaimed Waste Dump
- Topsoil
- ClayStockpile
- Potential Borrow Pits
- LVMC_Active_Project_Boundary
- CountyRoads

QUANTITIES (reported in Cubic Yards)

Topsoil:
A = 73,200 CY
B = 294,200
C = 236,600
D = 138,400
E = 269,300
F = 15,400
G = 25,200
H = 57,400

Clay = 678,000

Elevated Haul Road = 250,000

Borrow 1 = 121,000
Borrow 2 = 135,520

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MAP 5h

Reclamation - Topsoil Stockpile Locations

Designed By: A. Tarrant

Data: LVMC Engineering; ArcGIS

Current as of: July 2020